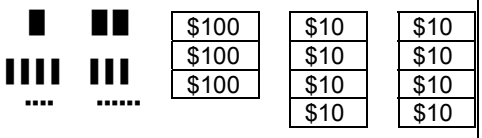
Standard 1: Number and Computation

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.

Third Grade Knowledge Base Indicators	Third Grade Application Indicators
The student… 1. knows, explains, and represents **($)**: a. whole numbers from 0 through 10,000 (2.4.K1a-b) b. fractions greater than or equal to zero (halves, fourths, thirds, eighths, tenths, sixteenths) (2.4.K1c) **($)**; c. decimals greater than or equal to zero through tenths place (2.4.K1c). 2. compares and orders: a. ▲ ■ whole numbers from 0 through 10,000 with and without the use of concrete objects (2.4.K1a-b) **($)**; b. fractions greater than or equal to zero with like denominators (halves, fourths, thirds, eighths, tenths, sixteenths) using concrete objects (2.4.K1a,c); c. decimals greater than or equal to zero through tenths place using concrete objects (2.4.K1a-c). 3. ▲ knows, explains, and uses equivalent representations including the use of mathematical models for: a. addition and subtraction of whole numbers from 0 through 1,000 (2.4.K1a-b) **($)**, e.g., 144 + 236 = 300 + 80  b. multiplication using the basic facts through the 5s and the multiplication facts of the 10s (2.4.K1a), e.g., 3 x 2 can be represented as 4 + 2 or as an array, X X X X X X; c. addition and subtraction of money (2.4.K1d) **($)**, e.g., three half dollars equals 50¢ + 50¢ + 50¢ or 50¢ + 100¢. 4. ▲**N** determines the value of mixed coins and bills with a total value of $50 or less (2.1.K1d) **($)**.	The student… 1. solves real-world problems using equivalent representations and concrete objects to **($)**: a. compare and order whole numbers from 0 through 5,000 (2.4.A1a-b), e.g., using base ten blocks, represent the total school attendance for a week; then represent the numbers using digits and compare and order in different ways; b. add and subtract whole numbers from 0 through 1,000 and when used as monetary amounts (2.4.A1a,d) **($)**, e.g., use real money to show at least 2 ways to represent $10.42; then subtract the cost of a book purchases at the school's book fair from $10.42 (the amount you have earned and can spend). 2. determines whether or not solutions to real-world problems that involve the following are reasonable **($)**. a. whole numbers from 0 through 1,000 (2.4.A1a-b)**,** e.g., a student says that there are 1,000 students in grade 3 at her school, is this reasonable? b. fractions greater than or equal to zero (halves, fourths, thirds, eighths, tenths, sixteenths) (2.4.A1a,c); e.g., you ate ½ of a sandwich and a friend ate ¾ of the same sandwich; is this reasonable? c. decimals greater than or equal to zero when used as monetary amounts (2.4.A1d), e.g., a pack of chewing gum costs what amount - $62 $.75 9¢ $75.00 750¢? Is this reasonable?; 3. determines the amount of change owed through $100.00 (2.4.A1d), e.g., school supplies cost $12.37. What was the amount of change received after giving the clerk $20.00? To solve, $20.00 – $12.37 = $7.63 (the change).

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.

Third Grade Knowledge Base Indicators	Third Grade Application Indicators
The student… 1. identifies, reads, and writes numbers using numerals and words from tenths place through ten thousands place (2.4.K1a-b) **($)**, e.g., sixty-four thousand, three hundred eighty and five tenths is written in numerical form as 64,380.5. 2. identifies, models, reads, and writes numbers using expanded form from tenths place through ten thousands place (2.4.K1b), e.g., 56,277.3 = (5 x 10,000) + (6 x 1,000) + (2 x 100) + (7 x 10) + (7 x 1) + (3 x .1) = 50,000 + 6,000 + 200 + 70 + 7 + .3. 3. classifies various subsets of numbers as whole numbers, fractions (including mixed numbers), or decimals (2.4.K1a-c, 2.4.K1i) 4. identifies the place value of various digits from tenths to one hundred thousands place (2.4.K1b) **($)**. 5. identifies any whole number through 1,000 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) **($)**: a. commutative properties of addition and multiplication, e.g., 7 + 8 = 8 + 7 or 3 x 6 = 6 x 3; b. zero property of addition (additive identity), e.g., 4 + 0 = 4; c. property of one for multiplication (multiplicative identity), 1 x 3 = 3; d. associative property of addition, e.g., (3 + 2) + 4 = 3 + (2 + 4); e. symmetric property of equality applied to addition and multiplication, e.g., 100 = 20 + 80 is the same as 20 + 80 = 100 and 3 x 4 = 12 is the same as 12 = 3 x 4; f. zero property of multiplication, e.g., 9 x 0 = 0 or 0 x 32 = 0. 7. divides whole numbers from 0 through 99,999 into groups of 10,000s; 1,000s; 100s; 10s, and 1s using base ten models (2.4.K1b).	The student… 1. solves real-world problems with whole numbers from 0 through 100 using place value models, money, and the concepts of these properties to explain reasoning (2.4.A1a-b,d) **($)**: a. commutative property of addition, e.g., a student has a dime, a nickel, and a quarter to purchase a pencil; he/she totals the amount of the coins to see whether or not there is enough money; the student could count the quarter, nickel, and dime as 25¢ + 5¢ + 10¢ or as 25¢ + 10¢ + 5¢ because adding in any order does not change the sum; b. zero property of addition, e.g., a student has 6 marbles in one pocket and none in the other, so all together there are: 6 + 0 = 6; c. associative property of addition, e.g., a student has two dimes and a quarter; there are 2 ways to group the coins to find the total: 10¢ (dime) + 10¢ (dime) = 20¢, then add the quarter, 20¢ + 25¢ (quarter) = 45¢ or 10¢ (dime) + 25¢ (quarter) = 35¢, then add the other dime to 35¢ and 35¢ + 10¢ = 45¢ or (D + D) + Q = D + (D + Q) using coins or money models. 2. performs various computational procedures with whole numbers from 0 through 100 using the concepts of these properties and explains how they were used (2.4.A1a-b): a. commutative property of multiplication, e.g., given 4 x 6, the student says: I know that 4 x 6 is 24 because I know 6 x 4 is 24 and multiplying in any order gets the same answer; b. zero property of multiplication without computing, e.g., 7 x 3 x 4 x 0 x 5 = □, the student says: I know the answer (product) is zero because no matter how many factors you have, when you multiply with a 0, the product is zero; c. associative property of addition, e.g., 9 + 8 could be solved as 1 + (8 + 8) or (1 + 8) + 8, the student says: I don't know 9 + 8, but I know my doubles (8 + 8), so I made the 9 into 1 + 8 and added 8 + 8 and then added 1 more to make 17.

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.

Third Grade Knowledge Base Indicators	Third Grade Application Indicators
The student… 1. estimates whole numbers quantities from 0 through 1,000; fractions (halves, fourths); and monetary amounts through $500 using various computational methods including mental math, paper and pencil, concrete objects, and appropriate technology (2.4.K1a-d) **($)**. 2. uses various estimation strategies to estimate using whole number quantities from 0 through 1,000 and explains the process used (2.4.K1a) **($)** e.g., 362 rounded to the nearest ten is 360 and 362 rounded to the nearest hundred is 400. Using front-end estimation, 362 is about 300 or 400 depending on the context of the problem. Using a "nice" number, 362 is about 350 because of the benchmark number – 350, since 350 is the halfway point between 300 and 400. 3. recognizes and explains the difference between an exact and an approximate answer (2.4.K1a), e.g., when asked how many students are in a classroom, an exact answer could be 24. Whereas, an approximate answer could be 20 since 24 could be rounded down to the nearest ten (**underestimated**) or rounded up to 30 (**overestimated**).	The student… 1. adjusts original whole number estimate of a real-world problem using numbers from 0 through 1,000 based on additional information (a frame of reference) (2.4.A1a) **($)**, e.g., if 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 $500 is reasonable and makes predictions based on the information (2.4.A1a-b,d) **($)**, e.g., at the movies, you bought popcorn for $2.35 and a soda for $2.50; and then paid $4.50 for a ticket. Is it reasonable to say you spent $10? How much will you need to save to go to the movies once a week for the next month? 3. selects a reasonable magnitude from three given quantities based on a familiar problem situation and explains the reasonableness of the results (2.4.A1a), e.g., about how many students are in my class today – 2, 20, 200? 4. determines if a real-world problem with whole numbers from 0 through 1,000 calls for an exact or approximate answer and performs the appropriate computation using various computational methods including mental math, paper and pencil, concrete objects, and appropriate technology (2.4.A1a) **($)**.

Standard 1: Number and Computation

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

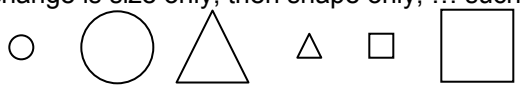
Benchmark 4: Computation – The student demonstrates an understanding of computation in a variety of situations.

Third Grade Knowledge Base Indicators	Third Grade Application 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) **($)**. 2. **N** states and uses with efficiency and accuracy the multiplication facts through the 5s and the multiplication facts of the 10s and corresponding division facts (2.4.K1a) **($)**. 3. skip counts (multiples) by 2s, 3s, 4s, 5s, and 10s (2.4.K1a). 4. **N** performs and explains these computational procedures: a. adds and subtracts whole numbers from 0 through 10,000 (2.4.K1a-b); b. multiplies whole numbers when one factor is 5 or less and the other factor is a multiple of 10 through 1,000 with or without the use of concrete objects (2.4.K1a-b), e.g., 400 x 3 = 120 or 70 x 5 = 350; c. adds and subtracts monetary amounts using dollar and cents notation through $500.00 (2.4.K1d) **($)**, e.g., $47.07 + $356.96 = $404.03. 5. fair shares/measures out (divides) a total amount through 100 concrete objects into equal groups (2.4.K1a-b), e.g., fair sharing 52 pieces of candy with 8 friends resulting in eight groups of 6 with four pieces left over or measuring out into groups of eight 52 pieces of candy with four pieces left over. 6. explains the relationship between addition and subtraction (2.4.K1a-b) **($)**. 7. ▲■ **N** identifies multiplication and division fact families through the 5s and the multiplication and division fact families of the 10s (2.4.K1a), e.g., when given 6 x □ = 18, the student recognizes the remaining members of the fact family. 8. reads and writes horizontally, vertically, and with different operational symbols the same addition, subtraction, multiplication, or division expression, e.g., 4 • 6 is the same as 4 x 6 or 4(6) or 6 and 10 divided by 2 is the same as 10 ÷ 2 or $\frac{10}{2}$ or $\underline{x\ 4}$.	The student… 1. ▲**N** solves one-step real-world addition or subtraction problems with **($)**: a. whole numbers from 0 through 10,000 (2.4.A1a-b), e.g., for the food drive, the school collected 564 cans (cylinders) and 297 boxes (rectangular prisms). How many items did they collect in all? This problem could be solved with base 10 models: by adding 500 + 200 (700), 60 + 90 (150), and 4 + 7 (11), so 700 + 150 + 11= 861; by adding 564 + 300 (864) and 297 is 3 less than 300, so 864 – 3 = 861; or by using the traditional algorithm; b. monetary amounts using dollar and cents notation through $500.00 (2.4.A1a-b,d), e.g., you are shopping for a new bicycle; at The Bike Store, the bike you want is $189.69 and at Sports for All, it is $162.89. How much will you save by buying the bike at Sports for All? 2. **N** generates a family of multiplication and division facts through the 5s (2.4.A1a), e.g., if the student writes 5 x 9 = 45, the remaining facts generated are: 9 x 5 = 45, 45 ÷ 5 = 9, 45 ÷ 9 = 5.

Standard 2: Algebra

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

Benchmark 1: Patterns – The student demonstrates an understanding of relationships in patterns in a variety of situations.

Third Grade Knowledge Base Indicators	Third Grade Application Indicators
The student… 1. uses concrete objects, drawings, and other representations to work with these **types** of patterns (2.4.K1a): a. repeating patterns, e.g., an AB pattern is like 1-2, 1-2, …; an ABC pattern is like dog-horse-pig, dog-horse-pig, …; an AAB pattern is like ↑↑→, ↑↑→, …; b. growing patterns, e.g., 1, 4, 7, 10, … 2. uses these **attributes** to generate patterns: a. counting numbers related to number theory (2.4.K1a), e.g., evens, odds, or multiples through the 5s; b. whole numbers that increase or decrease (2.4.K1a) **($)**,e.g., 3, 6, 9, …; 20, 15, 10, …; c. geometric shapes including one attribute change (2.4.K1f), e.g., ■-□-Δ-▲, ■-□-Δ-▲, ■-□-Δ-▲,… where the pattern is filled-in square, square, triangle, filled-in triangle, …; or when using attribute blocks the change is size only, then shape only, … such as  …; d. measurements (2.4.K1a), e.g., 1 ft, 2 ft, 3 ft, …; 3 lbs, 6 lbs, 9 lbs; or 2 cups, 4 cups, 6 cups, …; e. money and time (2.4.K1a,d) **($)**, e.g., $.25, $.50, $.75, … or 1:05 p.m., 1:10 p.m., 1:15 p.m., …; f. things related to daily life (2.4.K1a), e.g., water cycle, food cycle, or life cycle;	The student… 1. generalizes the following patterns using a written description: a. counting numbers related to number theory (2.4.A1a); b. whole number patterns (2.4.A1a) **($)**, c. patterns using geometric shapes (2.4.A1f), d. measurement patterns (2.4.A1a), e. money and time patterns (2.4.A1a,d) **($)**, f. patterns using size, shape, color, texture, or movement (2.4.A1a). 2. ▲ recognizes multiple representations of the same pattern (2.4.A1a) e.g., the ABC pattern could be represented by clap, snap, stomp, …; red, green, yellow, …; tricycle, bicycle, unicycle, …; or 3, 2, 1, …
g. things related to size, shape, color, texture, or movement (2.4.K1a), e.g., red-green, red-green, red-green, …; snapping fingers; clapping hands; stomping feet; or tossing a bean bag over the head, under the leg, and behind the back (kinesthetic patterns). 3. identifies, states, and continues a pattern presented in various formats including numeric (list or table), visual (picture, table, or graph), verbal (oral description), kinesthetic (action), and written (2.4.K1a) **($)**. 4. generates: a. repeating patterns (2.4.K1a), b. growing (extending) patterns (2.4.K1a), c. patterns using function tables (input/output machines, T-tables) (2.4.K1e).	

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.

Third Grade Knowledge Base Indicators	Third Grade Application Indicators
The student… 1. explains and uses symbols to represent unknown whole number quantities from 0 through 1,000 (2.4.K1a) 2. finds the sum or difference in one-step equations with **($)**: a. whole numbers from 0 through 99 (2.4.K1a) e.g., 89 = 76 + y or y – 23 = 32; b. monetary values through a dollar (2.4.K1d), e.g., 25¢ + 10¢ + 5¢ = n. 3. finds the unknown in the multiplication and division fact families through the 5s and the 10s (2.4.K1a), e.g., 3 • □ = 4 • 6. 4. compares two whole numbers from 0 through 1,000 using the equality and inequality symbols (=, <, >) and their corresponding meanings (is equal to, is less than, is greater than) (2.4.K1a-b) **($)**.	The student… 1. represents real-world problems using symbols with one operation and one unknown that (2.4.A1a) **($)**: a. adds or subtracts using whole numbers from 0 through 99, e.g., when asked to represent the number of 3rd graders in a school, students write: 21 + 18 + 19 = □ ; b. multiplies or divides using the basic facts through the 5s and the basic facts of the 10s, e.g., juice comes in packs of 4. How many packs are needed for 32 third-graders? Students could write: 32 ÷ 4 = J. 2. generates one-step equations to solve real-world problems with one unknown and a whole number solution that (2.4.A1a) **($)**: a. adds or subtracts using the basic fact families, e.g., when asked to generate a simple equation, a student says: I have 5 dogs and 2 fish. How many pets do I have? This is represented by 5 + 2 = P and to solve for P, add 5 and 2, P = 7. b. multiplies or divides using the basic facts through the 5s and the basic facts of the 10s, e.g., Tom has a sticker book and each page holds 5 stickers. If the same number of stickers is placed on each page, the book will hold 30 stickers. How many pages are in his book? This is represented by 5 x S = 30 or 30 ÷ 5 = S. 3. generates (2.4.A1a) **($)**: a. a real-world problem with one operation that matches a given addition equation or subtraction equation using whole numbers from 0 through 99, e.g., given the subtraction equation, 69 – G = 37, the problem could be written: You have 69 guppies and give away some to a friend and have 37 left. How many guppies did you give away? b. a real-world problem with one operation that matches a given multiplication equation or division equation using basic facts through the 5s and the basic facts of the 10s, e.g., the problem could be: I have 25 pictures and glue 5 pictures on each page of my album. How many pages will I need to use? The equation: 25/5 = Δ. c. number comparison statements using equality and inequality symbols (=, <, >) for whole numbers from 0 through 100, measurement, and money $, e.g.4 ft 4 in > 4 ft 2 in.

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.

Third Grade Knowledge Base Indicators

The student…

1. states mathematical relationships between whole numbers from 0 through 200 using various methods including mental math, paper and pencil, concrete objects, and appropriate technology (2.4.K1a) **($)**, e.g., every time a quarter is added to the amount; 25¢ is added to the total.
2. finds the values and determines the rule with one operation (addition, subtraction) of whole numbers from 0 through 200 using a horizontal or vertical function table (input/output machine, T-table) (2.4.K1e), e.g., using this input/output machine, different student responses might be that the rule is Input minus 10 equals Output, the rule is N – 10, or the rule is subtract 10.

Input	Output
92	82
156	146
13	3
113	103
?	59
106	?
?	?
N	?

3. ▲ generalizes numerical patterns using whole numbers from 0 through 200 with one operation (addition, subtraction) by stating the rule using words, e.g., if the sequence is 30, 50, 70, 90, …; in words, the rule is add twenty to the number before.
4. uses a function table (input/output machine, T-table) to identify and plot ordered pairs in the first quadrant of a coordinate plane (2.4.K1a,e).

Third Grade Application Indicators

The student…

1. represents and describes mathematical relationships between whole numbers from 0 through 100 using concrete objects, pictures, written descriptions, symbols, equations, tables, and graphs (2.4.A1a) **($)**.
2. finds the rule, states the rule using words, and extends numerical patterns with whole numbers from 0 through 100 (2.4.A1a,e), e.g., at school each student must check out three library books. After the tenth student has checked out, how many total books will have been checked out? A solution using a function table might be:

Number of Students	1	2	5	10
Total Number Of Books	3	6	15	?

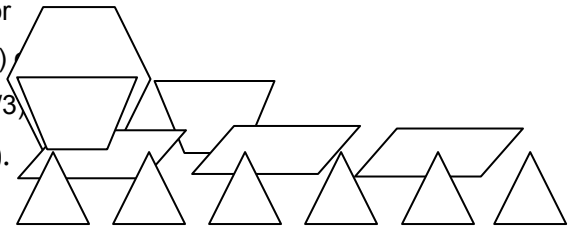
The rule could be that for every student, add three books or multiply the number of children by three to get the total number of books. Other solutions might be using a pattern to count by three ten times - 3, 6, 9, 12, 15, 18, 21, 24, 27, 30 - or skip count by three ten times.

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.

Third Grade Knowledge Base Indicators	Third Grade Application 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, number lines, coordinate planes/grids, hundred charts, measurement tools, multiplication arrays, or division sets) to model computational procedures and mathematical relationships (1.2.K1, 1.2.K.1a, 1.2.K2 1.2.K3, 1.2.K5-6, 1.3.K1-3, 1.4.K1-3, 1.4.K1a-b, 1.4.K5-7, 2.1.K1, 2.1.K2a, 2.1.K2d-g, 2.1.K3, 2.1.K4a-b, 2.2.K1, 2.2.K2, 2.2.K3-4, 2.3.K1, 2.3.K4, 3.2.K1-4, 3.3.K1, 3.4.K1-3, K.2.K3) **($)**; b. place value models (place value mats, hundred charts, base ten blocks or unifix cubes) to compare, order, and represent numerical quantities and to model computational procedures (1.1.K1c, 1.1.K2a, 1.1.K2c, 1.1.K3a, 1.2.K1-4, 1.2.K7, 1.3.K1, 1.4.K4a-b, 1.4.K5-6, 2.2.K4) **($)**; c. fraction models (fraction strips or pattern blocks) and decimal models (base ten blocks or coins) to compare, order, and represent numerical quantities (1.1.K1b, 1.1.K2b-c, 1.2.K3, 1.3.K1) **($)**; d. money models (base ten blocks or coins) to compare, order, and represent numerical quantities (1.1K3c, 1.1.K4, 1.3.K1, 1.4.K4c, 2.1.K2e, 2.2.K2b) **($)**; e. function tables (input/output machines, T-tables) to find numerical relationships (2.1.K4c, 2.3.K2, 2.3.K4) **($)**; f. two-dimensional geometric models (geoboards, dot paper, pattern blocks, or tangrams) to model perimeter, area, and properties of geometric shapes and three-dimensional geometric models (solids) and real-world objects to compare size and to model attributes of geometric shapes (2.1.K2c, 3.1.K1-6, 3.2.K5, 3.3.K2); g. two-dimensional geometric models (spinners), three-dimensional models (number cubes), and process models (concrete objects) to model probability (4.1.K1-2) **($)**; h. graphs using concrete objects, representational objects, or abstract representations, pictographs, frequency tables, horizontal and vertical bar graphs, Venn diagrams or other	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, number lines, coordinate planes/grids, hundred charts, measurement tools, multiplication arrays, or division sets) to model computational procedures and mathematical relationships and to model problem situations (1.2.A1, 1.2.A2a-b, 1.3.A1-4, 1.4.A1a-b, 1.4.A2, 2.1.A1a-b, 2.1.A1d-f, 2.1.A2, 2.2.A1-3, 2.2.A3a-c, 2.3.A1-2, 3.2.A1-3, 3.3.A1-2, 3.4.A1, 4.2.A2) **($)**; b. place value models (place value mats, hundred charts, base ten blocks, or unifix cubes) to compare, order, and represent numerical quantities and to model computational procedures (1.1.A1a, 1.1.A2a, 1.2.A1-2, 1.3.A2, 1.4.A1a-b) **($)**; c. fraction models (fraction strips or pattern blocks) and decimal models (base ten blocks or coins) to compare, order, and represent numerical quantities (1.1.A2b) **($)**; d. money models (base ten blocks or coins) to compare, order, and represent numerical quantities (1.1.A1b, 1.1.A2c, 1.2.A1, 1.3.A2, 1.4.A1b, 2.1.A1e, 2.2.A3c) **($)**; e. function tables (input/output machines, T-tables) to model numerical relationships (2.3.A2) **($)**; f. two-dimensional geometric models (geoboards, dot paper, pattern blocks, or tangrams) to model perimeter, area, and properties of geometric shapes and three-dimensional geometric models (solids) and real-world objects to compare size and to model attributes of geometric shapes (2.1.A1c, 3.1.A1-3); g. two-dimensional geometric models (spinners), three-dimensional models (number cubes), and process models (concrete objects) to model probability (4.1.A1-2) **($)**; h. graphs using concrete objects, representational objects, or abstract representations pictographs, frequency tables, horizontal and vertical bar graphs, Venn diagrams or other pictorial displays, line plots, charts and tables to organize and display data (4.1.A1-2, 4.2.A1a-d, 4.2.A1f-g, 4.2.A3) **($)**; i. Venn diagrams to sort data and show relationships.

pictorial displays, line plots, charts, and tables to organize and display data (2.3.K4, 4.1.K2, 4.2.K1a-d, 4.2.K1f-g, 4.2.K2) **($)**; i. Venn diagrams to sort data and show relationships (1.2. 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 as a (1/1) or two (2/2) three (3/3) six(6/6). 	2. selects a mathematical model that is more useful than other mathematical models in a given situation.

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.

Third Grade Knowledge Base Indicators	Third Grade Application Indicators
The student… 1. recognizes and investigates properties of plane figures (circles, squares, rectangles, triangles, ellipses, rhombi, octagons) using concrete objects, drawings, and appropriate technology (2.4.K1f). 2. recognizes, draws, and describes plane figures (circles, squares, rectangles, triangles, ellipses, rhombi, octagons) (2.4.K1f). 3. ■ recognizes the solids (cubes, rectangular prisms, cylinders, cones, spheres) (2.4.K1f). 4. ▲ recognizes and describes the square, triangle, rhombus, hexagon, parallelogram, and trapezoid from a pattern block set (2.4.K1f). 5. recognizes and describes a quadrilateral as any four-sided figure (2.4.K1f). 6. determines if geometric shapes and real-world objects contain line(s) of symmetry and draws the line(s) of symmetry if the line(s) exist(s) (2.4.K1f).	The student… 1. solves real-world problems by applying properties of plane figures (circles, squares, rectangles, triangles, ellipses) to (2.4.A1f), e.g., the teacher asked each student to draw a rectangle. A student draws a square. Did the student follow directions? Why or why not? 2. demonstrates how (2.4.A1f): a. plane figures (circles, squares, rectangles, triangles, ellipses, rhombi, hexagons, trapezoids) can be combined to make a new shape; b. solids (cubes, rectangular prisms, cylinders, cones, spheres) can be combined to make a new shape. 1. identifies the plane figures (circles, squares, rectangles, triangles, ellipses, rhombi, hexagons, trapezoids) used to form a composite figure (2.4.A1f).

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.

Third Grade Knowledge Base Indicators	Third Grade Application Indicators
The student… 1. uses whole number approximations (estimations) for length, width, weight, volume, temperature, time, and perimeter using standard and nonstandard units of measure (2.4.K1a) **($)**. 2. ▲ reads and tells time to the minute using analog and digital clocks (2.4.K1a). 3. selects, explains the selection of, and uses measurement tools, units of measure, and degree of accuracy appropriate for a given situation **to measure** (2.4.K1a) **($)**: a. length width, and height to the nearest half inch, inch, foot, and yard; and to the nearest whole unit of nonstandard unit; b. length, width, and height to the nearest centimeter and meter; c. weight to the nearest whole unit of a nonstandard unit; d. volume to the nearest cup, pint, quart, and gallon; e. volume to the nearest liter; f. temperature to the nearest degree. 4. states (2.4.K1a): a. the number of hours in a day and days in a year; b. the number of inches in a foot, inches in a yard, and feet in a yard; c. the number of centimeters in a meter; d. the number of cups in a pint, pints in a quart, and quarts in a gallon. 5. finds the perimeter of squares, rectangles, and triangles given the measures of all the sides (2.4.K1f).	The student… 1. solves real-world problems by applying appropriate measurements: a. ▲ length to the nearest inch, foot, or yard, e.g., Jill has a piece of rope that is 36 inches long and Bob has a piece that is 15 inches long. If they put their pieces together, how long would the piece of rope be? b. ▲ length to the nearest centimeter or meter, e.g., a new pencil is about how many centimeters long? c. length to the nearest whole unit of a nonstandard unit, e.g., how many paper clips long is a hot dog? d. temperature to the nearest degree, e.g., what would the temperature outside be if it was a good day for swimming? e. ▲ number of days in a week, e.g., if school started 37 weeks ago, how many days of school have passed? 2. estimates to check whether or not measurements or calculations for length, temperature, and time in real-world problems are reasonable (2.4.A1a) **($)**, e.g., after finding the range of temperature over a two-week period, determine whether or not the answer is reasonable. 3. adjusts original measurement or estimation for length, weight, temperature, and time in real-world problems based on additional information (a frame of reference) (2.4.A1a) **($)**, e.g., the class estimates that the class gerbil weighs as much as a box of 24 crayons. The gerbil is placed on one side of the pan balance and a box of 16 crayons is placed on the other side. The pan balance barely moves. Should the estimate of the gerbil's weight be adjusted?

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.

Third Grade Knowledge Base Indicators	Third Grade Application Indicators
The student… 1. knows and uses cardinal points (north, south, east, west) and intermediate points (northeast, southeast, northwest, southwest) (2.4.K1a). 2. recognizes and performs one transformation (reflection/flip, rotation/turn, and translation/slide) on a two-dimensional figure (2.4.K1f).	The student… 1. recognizes real-world transformations (reflection/flip, rotation/turn, and translation/slide) (2.4.A1a), e.g., tiles in a ceiling, bricks in a sidewalk, or steps on a playground slide. 2. gives and uses directions to move from one location to another on a map and follows directions including the use of cardinal and intermediate points (2.4.A1a).

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.

Third Grade Knowledge Base Indicators	Third Grade Application Indicators
The student… 1. uses a number line (horizontal/vertical) to model the basic multiplication facts through the 5s and the multiplication facts of the 10s (2.4.K1a). 2. identifies points on a coordinate plane (coordinate grid) using (2.4.K1a): a. two positive whole numbers, b. a letter and a positive whole number. 3. identifies points as ordered pairs in the first quadrant of a coordinate plane (coordinate grid) (2.4.K1a).	The student… 1. solves real-world problems using coordinate planes (coordinate grids) and map grids that have positive whole number and letter coordinates (2.4.A1a), e.g., identifying locations on a map or giving and following directions to move from one location to another.

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.

Third Grade Knowledge Base Indicators	Third Grade Application Indicators
The student… 1. recognizes any outcome of a simple event in an experiment or simulation as impossible, possible, certain, likely, unlikely, or equally likely (2.4.K1g) **($)**. 1. ▲ ■ 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).	The student… 1. makes predictions 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 uses the results to draw conclusions about the event (2.4.A1g-h). 2. compares what should happen (theoretical probability/expected results) with what did happen (experimental probability/empirical results) in an experiment or simulation with a simple event (2.4.A1g).

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.

Third Grade Knowledge Base Indicators	Third Grade Application 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) **($)**: a. graphs using concrete objects; b. pictographs with a whole symbol or picture representing one, two, five, ten, twenty-five, or one-hundred (no partial symbols or pictures); c. frequency tables (tally marks); d. horizontal and vertical bar graphs; e. Venn diagrams or other pictorial displays, e.g., glyphs; f. line plots; g. charts and tables. 2. collects data using different techniques (observations, polls, surveys, or interviews) and explains the results (2.4.K1h) **($)**. 3. ▲ finds these statistical measures of a data set with less than ten data points using whole numbers from 0 through 1,000 (2.4.K1a) **($)**: a. minimum and maximum data values, b. range, c. mode (uni-modal only), d. median when data set has an odd number of data points.	The student… 1. interprets and uses data to make reasonable inferences and predictions, answer questions, and make decisions from these **data displays** (2.4.A1h) **($)**: a. graphs using concrete objects; b. pictographs with a whole symbol or picture representing one, two, five, ten, twenty-five, or one-hundred (no partial symbols or pictures); c. frequency tables (tally marks); d. horizontal and vertical bar graphs; e. Venn diagrams or other pictorial displays; f. line plots; g. charts and tables. 2. uses these statistical measures with a data set of less than ten data points using whole numbers from 0 through 1,000 to make reasonable inferences and predictions, answer questions, and make decisions (2.4.A1a) **($)**: a. minimum and maximum data values, b. range, c. mode, d. median when data set has an odd number of data points. 3. recognizes that the same data set can be displayed in various formats including the use of concrete objects (2.4.A1h) **($)**.

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Math Curriculum

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