

Kansas City, Kansas Public Schools Unified District #500
Grade 3 Mathematics Standards

Standard - 1: Number and Computation

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

Grade 3 Benchmarks

3.1.1 Number Sense - The student demonstrates number sense for whole numbers, fractions, decimals, and money using concrete objects in a variety of situations.

3.1.1.K1 Knows, explains, and represents:

3.1.1.K1a Whole numbers from 0 through 10,000 (3.2.4.K1a-b)

3.1.1.K1b Fractions greater than or equal to zero (halves, fourths, thirds, eighths, tenths, sixteenths) (3.2.4.K1c)

3.1.1.K1c Decimals greater than or equal to zero through tenths place (3.2.4.K1c).

3.1.1.K2 Compares and orders:

3.1.1.K2a **S** Whole numbers from 0 through 10,000 with and without the use of concrete objects (3.2.4.K1a-b)

3.1.1.2b Fractions greater than or equal to zero with like denominators (halves, fourths, thirds, eighths, tenths, sixteenths) using concrete objects (3.2.4.K1a,c);

3.1.1.K2c Decimals greater than or equal to zero through tenths place using concrete objects (3.2.4.K1a-c)

3.1.1.K3 **S** Knows, explains, and uses equivalent representations including the use of mathematical models for:

3.1.1.K3a Addition and subtraction of whole numbers from 0 to 1,000 (3.2.4.K1a-b)

e.g. \$144
 +\$236
 is the same as
 \$300
 +\$ 80

\$100	
\$100	
\$100	
+	
\$10	\$10
\$10	\$10
\$10	\$10
\$10	\$10

3.1.1.K3b Multiplication using the basic facts through the 5s and the multiplication facts of the 10s (3.2.3.K1a)

e.g. 3 X 2 can be represented as 4 + 2 or as an array, $\begin{array}{ccc} X & X & X \\ & & X \\ X & X & \end{array}$

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- 3.1.1.K3c Addition and subtraction of money (3.2.4.K1d)
 e.g. three half dollars equals $50¢ \times 3$ or $50¢ + 100¢$.
- 3.1.1.K4 **S** Determines the value of mixed coins and bills with a total value of \$50 or less (3.2.1.K1d) (*without a calculator on the state assessment*).
- 3.1.1.A1 Solves real-world problems using equivalent representations and concrete objects to:
- 3.1.1.A1a Compare and order whole numbers from 0 through 5,000 (3.2.4.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
- 3.1.1.A1b Add and subtract whole numbers from 0 through 1,000 and when used as monetary amounts (3.2.4.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).
- 3.1.1.A2 Determines whether or not solutions to real-world problems that involve the following are reasonable:
- 3.1.1.A2a Whole numbers from 0 through 1,000 (3.2.4.A1a-b),
 e.g. A student says that there are 1,000 students in grade 3 at her school, is this reasonable?
- 3.1.1.A2b Fractions greater than or equal to zero (halves, fourths, thirds, eighths, tenths, sixteenths) (3.2.4.A1a,c);
 e.g., You ate $\frac{1}{2}$ of a sandwich and a friend ate $\frac{3}{4}$ of the sandwich; is this reasonable?
- 3.1.1.A2c Decimals greater than or equal to zero when used as monetary amounts (3.2.4.A1d),
 e.g., A pack of chewing gum costs what amount - \$62 \$.75 9¢ 75.00 750¢? Is this reasonable?
- 3.1.1.A2d Determines the amount of change owed through \$100.00 (3.2.4.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).
- 3.1.2 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, fractions, decimals, and money in a variety of situations.
- 3.1.2.K1 Identifies, reads, and writes numbers using numerals and words from

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tenths place through ten thousands place (3.2.4.K1a-b),

e.g., Sixty-four thousand, three hundred eighty and five tenths is written in numerical form as 64,380.5.

- 3.1.2.K2 Identifies, models, reads, and writes numbers using expanded form from tenths place through ten thousands place (3.2.4.K1b),
 e.g., $56,277.3 = (5 \times 10,000) + (6 \times 1,000) + (2 \times 100) + (7 \times 10) + (7 \times 1) + (3 \times .1)$.
- 3.1.2.K3 Classifies various subsets of numbers as whole numbers, fractions (including mixed numbers), or decimals (3.2.4.K1a-c, 3.2.4.K1i)
- 3.1.2.K4 Identifies the place value of various digits from tenths to one hundred thousands place (3.2.4.K1b)
- 3.1.2.K5 Identifies any whole number through 1,000 as even or odd (3.2.4.K1a).
- 3.1.2.K6 Uses the concepts of these properties with whole numbers from 0 through 100 and demonstrates their meaning including the use of concrete objects (3.2.4.K1a)
- 3.1.2.K6a Commutative properties of addition and multiplication, e.g., $7 + 8 = 8 + 7$ or $3 \times 6 = 6 \times 3$
- 3.1.2.K6b Zero property of addition (additive identity), e.g., $4 + 0 = 4$
- 3.1.2.K6c Property of one for multiplication (multiplicative identity), $1 \times 3 = 3$
- 3.1.2.K6d Associative property of addition, e.g., $(3 + 2) + 4 = 3 + (2 + 4)$;
- 3.1.2.K6e Symmetric property of equality applied to addition and multiplication, e.g., $100 = 20 + 80$ is the same as $20 + 80 = 100$ and $3 \times 4 = 12$ is the same as $12 = 3 \times 4$
- 3.1.2.K6f Zero property of multiplication, e.g., $9 \times 0 = 0$ or $0 \times 32 = 0$
- 3.1.2.K7 Divides whole numbers from 0 through 99,999 into groups of 10,000s; 1,000s; 100s; 10s, and 1s using base ten models (3.2.4.K1b)
- 3.1.2.A1 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 (3.2.4.A1a-b,d):
- 3.1.2.A1a 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 $25\text{¢} + 5\text{¢} + 10\text{¢}$ or as $25\text{¢} + 10\text{¢} + 5\text{¢}$ because adding in any order does not change the sum;
- 3.1.2.A1b Zero property of addition,

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- e.g., A student has 6 marbles in one pocket and none in the other, so all together there are: $6 + 0 = 6$
- 3.1.2.A1c 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
 $(D + D) + Q = D + (D + Q)$ (coin pictures).
- 3.1.2.A2 Performs various computational procedures with whole numbers from 0 through 100 using the concepts of these properties and explains how they were used (3.2.4.A1a-b):
- 3.1.2.A2a Commutative property of multiplication,
- e.g., given 4×6 , the student says: I know that 4×6 is 24 because I know 6×4 is 24 and multiplying in any order gets the same answer
- 3.1.2.A2b Zero property of multiplication without computing,
- e.g., $7 \times 3 \times 4 \times 0 \times 5 = ?$, 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
- 3.1.2.A2c 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.
- 3.1.3 Estimation - The student uses computational estimation with whole numbers, fractions, and money in a variety of situations.
- 3.1.3.K1 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 (3.2.4.K1a-d)
- 3.1.3.K2 Uses various estimation strategies to estimate using whole number quantities from 0 through 1,000 and explains the process used (3.2.4.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.
- 3.1.3.K3 Recognizes and explains the difference between an exact and an approximate answer (3.2.4.K1a),

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- 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**)
- 3.1.3.A1 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) (3.2.4.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.
- 3.1.3.A2 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 (3.2.4.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?
- 3.1.3.A3 Selects a reasonable magnitude from three given quantities based on a familiar problem situation and explains the reasonableness of the results (3.2.4.A1a),
- e.g., About how many students are in my class today - 2, 20, 200?
- 3.1.3.A4 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 (3.2.4.A1a)
- 3.1.4 Computation - The student models, performs, and explains computation with whole numbers and money including the use of concrete objects in a variety of situations.
- 3.1.4.K1 Computes with efficiency and accuracy using various computational methods including mental math, paper and pencil, concrete objects, and appropriate technology (3.2.4.K1a)
- 3.1.4.K2 States and uses with efficiency and accuracy the multiplication facts through the 5s and the multiplication facts of the 10s and corresponding division facts (3.2.4.K1a)(*without a calculator*)
- 3.1.4.K3 Skip counts (multiples) by 2s, 3s, 4s, 5s, and 10s (3.2.4.K1a).
- 3.1.4.K4 Performs and explains these computational procedures(*without a calculator*):
- 3.1.4.K4a adds and subtracts whole numbers from 0 through 10,000 (2.4.K1a-b);
- 3.1.4.K4b 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., $400 \times 3 = 120$ or $70 \times 5 = 350$;

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- 3.1.4.K4c adds and subtracts monetary amounts using dollar and cents notation through \$500.00 (2.4.K1d),
 e.g., $\$47.07 + \$356.96 = \$404.03$.
- 3.1.4.K5 Fair shares/measures out (divides) a total amount through 100 concrete objects into equal groups (3.2.4.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.
- 3.1.4.K6 Explains the relationship between addition and subtraction (3.2.4.K1a-b)
- 3.1.4.K7 **S** Identifies multiplication and division fact families through the 5s and the multiplication and division fact families of the 10s (3.2.4.K1a) (*without a calculator*)
 e.g., when given $6 \times \square = 18$, the student recognizes the remaining members of the fact family.
- 3.1.4.A1 **S** solves one-step real-world addition or subtraction problems with (*without a calculator*):
- 3.1.4.A1a **S** whole numbers from 0 through 10,000 (3.2.4.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.
- 3.1.4.A1b **S** monetary amounts using dollar and cents notation through \$500.00 (3.2.4.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?
- 3.1.4.A2 generates a family of multiplication and division facts through the 5s (3.2.4.A1a) (*without a calculator*)
 e.g., If the student writes $5 \times 9 = 45$, the remaining facts generated are: $9 \times 5 = 45$, $45 \div 5 = 9$, $45 \div 9 = 5$.

Standard - 2: Algebra

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

Grade 3 Benchmarks

- 3.2.1 Patterns - The student recognizes, describes, extends, develops, and explains relationships in patterns using concrete objects in a variety of situations.
- 3.2.1.K1 Uses concrete objects, drawings, and other representations to work with types of patterns (3.2.4.K1a):
- 3.2.1.K1a repeating patterns, e.g., an AB pattern is like 1-2, 1-2, ...; an

Legend: S:State N:National L:Local

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- ABC pattern is like dog-horse-pig, dog-horse-pig, ...; an AAB pattern is like $\neg\neg\pm$, $\neg\neg\pm$, ...
- 3.2.1.K1b growing patterns, e.g., 1, 4, 7, 10, ...
- 3.2.1.K2 Uses these attributes to generate patterns:
- 3.2.1.K2a counting numbers related to number theory (3.2.4.K1a), e.g., evens, odds, or multiples through the 5s
- 3.2.1.K2b whole numbers that increase or decrease (3.2.4.K1a),
 e.g., 3, 6, 9, ...; 20, 15, 10, ...
- 3.2.1.K2c geometric shapes including one attribute change (3.2.4.K1f)
 e.g. \blacksquare - \square -r-p , \blacksquare - \square -r-p , \blacksquare - \square -r-p , ...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
- ○ r r □ □
- 3.2.1.K2d measurements (3.2.4.K1a)
 e.g., 1 ft, 2 ft, 3 ft, ...; 3 lbs, 6 lbs, 9 lbs; or 2 cups, 4 cups, 6 cups, ...;
- 3.2.1.K2e money and time (3.2.4.K1a,d) \$
 e.g., \$.25, \$.50, \$.75, ... or 1:05 p.m., 1:10 p.m., 1:15 p.m., ...;
- 3.2.1.K2f things related to daily life (3.2.4.K1a)
 e.g., water cycle, food cycle, or life cycle;
- 3.2.1.K3 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 (3.2.4.K1a)
- 3.2.1.K4 Generates:
- 3.2.1.K4a repeating patterns (3.2.4.K1a)
- 3.2.1.K4b growing (extending) patterns (3.2.4.K1a)
- 3.2.1.K4c patterns using function tables (input/output machines, T-tables) (3.2.4.K1e)
- 3.2.1.A1 Generalizes the following patterns using a written description:
- 3.2.1.A1a counting numbers related to number theory (3.2.4.A1a)
- 3.2.1.A1b whole number patterns (3.2.4.A1a)
- 3.2.1.A1c patterns using geometric shapes (3.2.4.A1f)
- 3.2.1.A1d measurement patterns (3.2.4.A1a)
- 3.2.1.A1e money and time patterns (3.2.4.A1a,d)
- 3.2.1.A1f patterns using size, shape, color, texture, or movement (3.2.4.A1a)
- 3.2.1.A2 **S** Recognizes multiple representations of the same pattern (2.4.A1a)

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e.g., The ABC pattern could be represented by clap, snap, stomp, ...; red, green, yellow, ...; tricycle, bicycle, unicycle, ...; or 3, 2, 1, ...

- 3.2.2 Variables, Equations, and Inequalities - The student uses symbols and whole numbers to solve equations including the use of concrete objects in a variety of situations.
- 3.2.2.K1 explains and uses symbols to represent unknown whole number quantities from 0 through 1,000 (3.2.4.K1a)
 - 3.2.2.K2 finds the sum or difference in one-step equations with:
 - 3.2.2.K2a whole numbers from 0 through 99 (3.2.4.K1a) e.g., $89 = 76 + y$ or $y - 23 = 32$
 - 3.2.2.K2b monetary values through a dollar (3.2.4.K1d), e.g., $25¢ + 10¢ + 5¢ = n$
 - 3.2.2.K3 finds the unknown in the multiplication and division fact families through the 5s and the 10s (3.2.4.K1a)
e.g., $3 \cdot \square = 4 \cdot 6$.
 - 3.2.2.K4 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) (3.2.4.K1a-b)
 - 3.2.2.A1 represents real-world problems using symbols with one operation and one unknown that (3.2.4.A1a):
 - 3.2.2.A1a 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: $21 + 18 + 19 = \square$
 - 3.2.2.A1b 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: $32 \div 4 = J$.
 - 3.2.2.A2 generates one-step equations to solve real-world problems with one unknown and a whole number solution that (3.2.4.A1a):
 - 3.2.2.A2a 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, $P = 7$.
 - 3.2.2.A2b 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 $5 \times S = 30$ or $30 \div 5 = S$.
 - 3.2.2.A3 generates (3.2.4.A1a):
 - 3.2.2.A3a a real-world problem with one operation that matches a given addition equation or subtraction equation using whole numbers from 0 through 99

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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?

3.2.2.A3b 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: $25 \div 5 = r$.

3.2.2.A3c 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.

3.2.3 Functions - The student recognizes and describes whole number relationships using concrete objects in a variety of situations.

3.2.3K1 states mathematical relationships between whole numbers from 0 through 200 using various methods including mental math, paper and pencil, concrete objects, and appropriate technology (3.2.4.K1a)
 e.g. every time a quarter is added to the amount; 25¢ is added to the total.

3.2.3K2 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) (3.2.4.K1e),

e.g., using the input/output machine below, 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	?

3.2.3.K3 **S** 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.

3.2.3.K4 uses a function table (input/output machine, T-table) to identify and plot ordered pairs in the first quadrant of a coordinate plane (3.2.4.K1a,e)

3.2.3.A1 represents and describes mathematical relationships between whole numbers from 0 through 100 using concrete objects, pictures, written descriptions, symbols, equations, tables, and graphs (3.2.4.A1a)

3.2.3.A2 finds the rule, states the rule using words, and extends numerical patterns

Legend: S:State N:National L:Local

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with whole numbers from 0 through 100 (3.2.4.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 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.

- 3.2.4 Models - The student develops and uses mathematical models including the use of concrete objects to represent and show mathematical relationships in a variety of situations.
- 3.2.4.K1 knows, explains, and uses mathematical models to represent mathematical concepts, procedures, and relationships. Mathematical models include:
- 3.2.4.K1a process models (concrete objects, pictures, number lines, coordinate planes/grids, hundred charts, measurement tools, multiplication arrays, division sets, or measurement tools) to model computational procedures and mathematical relationships (3.1.2.K1, 3.1.2.K.1a, 3.1.2.K2 3.1.2.K3, 3.1.2.K5-6, 3.1.3.K1-3, 3.1.4.K1-3, 3.1.4.K1a-b, 3.1.4.K5-7, 3.2.1.K1, 3.2.1.K2a, 3.2.1.K2d-g, 3.2.1.K3, 3.2.1.K4a-b, 3.2.2.K1, 3.2.2.K2, 3.2.2.K3-4, 3.2.3.K1, 3.2.3.K4, 3.3.2.K1-4, 3.3.3.K1, 3.3.4.K1-3,K.2,K3)
 - 3.2.4.K1b 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 (3.1.1.K1c, 3.1.1.K2a, 3.1.1.K2c, 3.1.1.K3a, 3.1.2.K1-4, 3.1.2.K7, 3.1.3.K1, 3.1.4.K4a-b, 3.1.4.K5-6, 3.2.2.K4)
 - 3.2.4.K1c fraction models (fraction strips or pattern blocks) and decimal models (base ten blocks or coins) to compare, order, and represent numerical quantities (3.1.1.K1b, 3.1.1.K2b-c, 3.1.2.K3, 3.1.3.K1)
 - 3.2.4.K1d money models (base ten blocks or coins) to compare, order, and represent numerical quantities (3.1.1K3c, 3.1.1.K4, 3.1.3.K1, 3.1.4.K4c, 3.2.1.K2e, 3.2.2.K2b)
 - 3.2.4.K1e function tables (input/output machines, T-tables) to find numerical relationships (3.2.1.K4c, 3.2.3.K2, 3.2.3.K4)
 - 3.2.4.K1f 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 (3.2.1.K2c, 3.3.1.K1-6, 3.3.2.K5, 3.3.3.K2)
 - 3.2.4.K1g two-dimensional geometric models (spinners), three-dimensional models (number cubes), and process models (concrete objects) to model probability (3.4.1.K1-2)

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- 3.2.4.K1h 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 (3.2.3.K4, 3.4.1.K2, 3.4.2.K1a-d, 3.4.2.K1f-g, 3.4.2.K2)
- 3.2.4.K1i Venn diagrams to sort data and show relationships (3.1.2.K3)
- 3.2.4.K2 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 (*please see resource manager for example*)
- 3.2.4.A1 recognizes that various mathematical models can be used to represent the same problem situation. Mathematical models include:
- 3.2.4.A1a 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 (3.1.2.A1, 3.1.2.A2a-b, 3.1.3.A1-4, 3.1.4.A1a, 3.1.4.A2, 3.2.1.A1a-b, 3.2.1.A1d-f, 3.2.1.A2, 3.2.2.A1-3, 3.2.2.A3a-c, 3.2.3.A1-2, 3.3.2.A1-3, 3.3.3.A1-2, 3.3.4.A1, 3.4.2.A2)
- 3.2.4.A1b 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 (3.1.1.A1a, 3.1.1.A2a, 3.1.2.A1-2, 3.1.3.A2, 3.1.4.A1a)
- 3.2.4.A1c fraction models (fraction strips or pattern blocks) and decimal models (base ten blocks or coins) to compare, order, and represent numerical quantities (3.1.1.A2b)
- 3.2.4.A1d money models (base ten blocks or coins) to compare, order, and represent numerical quantities (3.1.1.A1b, 3.1.1.A2c, 3.1.2.A1, 3.1.3.A2, 3.1.4.A1b, 3.2.1.A1e, 3.2.2.A3c)
- 3.2.4.A1e function tables (input/output machines, T-tables) to model numerical relationships (3.2.3.A2)
- 3.2.4.A1f 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 (3.2.1.A1c, 3.3.1.A1-3)
- 3.2.4.A1g two-dimensional geometric models (spinners), three-dimensional models (number cubes), and process models (concrete objects) to model probability (3.4.1.A1-2)
- 3.2.4.A1h 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 (3.4.1.A1-2, 3.4.2.A1a-d, 3.4.2.A1f-g, 3.4.2.A3)
- 3.2.4.A1i Venn diagrams to sort data and show relationships.
- 3.2.4.A2 selects a mathematical model that is more useful than other mathematical

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models in a given situation.

Standard - 3: Geometry

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

Grade 3 Benchmarks

- 3.3.1 Geometric Figures and Their Properties - The student recognizes geometric shapes and investigates their properties using concrete objects in a variety of situations.
- 3.3.1.K1 recognizes and investigates properties of plane figures (circles, squares, rectangles, triangles, ellipses, rhombi, octagons) using concrete objects, drawings, and appropriate technology (3.2.4.K1f).
 - 3.3.1.K2 recognizes, draws, and describes plane figures (circles, squares, rectangles, triangles, ellipses, rhombi, octagons) (3.2.4.K1f).
 - 3.3.1.K3 recognizes the solids (cubes, rectangular prisms, cylinders, cones, spheres) (3.2.4.K1f).
 - 3.3.1.K4 **S** recognizes and describes the square, triangle, rhombus, hexagon, parallelogram, and trapezoid from a pattern block set (3.2.4.K1f).
 - 3.3.1.K5 recognizes and describes a quadrilateral as any four-sided figure (3.2.4.K1f).
 - 3.3.1.K6 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) (3.2.4.K1f).
 - 3.3.1.A1 solves real-world problems by applying properties of plane figures (circles, squares, rectangles, triangles, ellipses) to (3.2.4.A1f), e.g., ex.
 - 3.3.1.A2 demonstrates how (3.2.4.A1f):
 - 3.3.1.A2a plane figures (circles, squares, rectangles, triangles, ellipses, rhombi, hexagons, trapezoids) can be combined to make a new shape
 - 3.3.1.A2b solids (cubes, rectangular prisms, cylinders, cones, spheres) can be combined to make a new shape
 - 3.3.1.A3 identifies the plane figures (circles, squares, rectangles, triangles, ellipses, rhombi, hexagons, trapezoids) used to form a composite figure (3.2.4.A1f)
- 3.3.2 Measurement and Estimation - The student estimates and measures using standard and nonstandard units of measure with concrete objects in a variety of situations.
- 3.3.2.K1 uses whole number approximations (estimations) for length, width, weight, volume, temperature, time, and perimeter using standard and nonstandard units of measure (3.2.4.K1a)
 - 3.3.2.K2 **S** reads and tells time to the minute using analog and digital clocks (3.2.4.K1a).
 - 3.3.2.K3 selects, explains the selection of, and uses measurement tools, units of measure, and degree of accuracy appropriate for a given situation **to measure** (3.2.4.K1a):
 - 3.3.2.K3a length width, and height to the nearest half inch, inch, foot, and yard;
and to the nearest whole unit of nonstandard unit;

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- 3.3.2.K3b length, width, and height to the nearest centimeter and meter;
- 3.3.2.K3c weight to the nearest whole unit of a nonstandard unit;
- 3.3.2.K3d volume to the nearest cup, pint, quart, and gallon;
- 3.3.2.K3e volume to the nearest liter;
- 3.3.2.K3f temperature to the nearest degree.
- 3.3.2.K4 states (3.2.4.K1a)
- 3.3.2.K4a the number of hours in a day and days in a year;
- 3.3.2.K4b the number of inches in a foot, inches in a yard, and feet in a yard;
- 3.3.2.K4c the number of centimeters in a meter;
- 3.3.2.K4d the number of cups in a pint, pints in a quart, and quarts in a gallon.
- 3.3.2.K5 finds the perimeter of squares, rectangles, and triangles given the measures of all the sides (3.2.4.K1f).
- 3.3.2.A1 solves real-world problems by applying appropriate measurements:
- 3.3.2.A1a **S** 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?
- 3.3.2.A1b **S** length to the nearest centimeter or meter
e.g., A new pencil is about how many centimeters long?
- 3.3.2.A1c length to the nearest whole unit of a nonstandard unit
e.g., How many paper clips long is a hot dog?
- 3.3.2.A1d temperature to the nearest degree
e.g., What would the temperature outside be if it was a good day for swimming?
- 3.3.2.A1e **S** number of days in a week
e.g., If school started 37 weeks ago, how many days of school have passed?
- 3.3.2.A2 estimates to check whether or not measurements or calculations for length, temperature, and time in real-world problems are reasonable (3.2.4.A1a)
e.g., after finding the range of temperature over a two-week period, determining whether or not the answer is reasonable.
- 3.3.2.A3 adjusts original measurement or estimation for length, weight, temperature, and time in real-world problems based on additional information (a frame of reference) (3.2.4.A1a)
- 3.3.3 Transformational Geometry - The student recognizes and performs one transformation on simple shapes or concrete objects in a variety of situations.
- 3.3.3.K1 knows and uses cardinal points (north, south, east, west) and intermediate points (northeast, southeast, northwest, southwest) (3.2.4.K1a).
- 3.3.3.K2 recognizes and performs one transformation (reflection/flip, rotation/turn,

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- and translation/slide) on a two-dimensional figure (3.2.4.K1f).
- 3.3.3.A1 recognizes real-world transformations (reflection/flip, rotation/turn, and translation/slide) (3.2.4.A1a), e.g., tiles in a ceiling, bricks in a sidewalk, or steps on a playground slide.
- 3.3.3.A2 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 (3.2.4.A1a).
- 3.3.4 Geometry From An Algebraic Perspective - The student relates geometric concepts to a number line and the first quadrant of a coordinate plane in a variety of situations.
- 3.3.4.K1 uses a number line (horizontal/vertical) to model the basic multiplication facts through the 5s and the multiplication facts of the 10s (3.2.4.K1a).
- 3.3.4.K2 identifies points on a coordinate plane (coordinate grid) using (3.2.4.K1a):
- 3.3.4.K2a two positive whole numbers
- 3.3.4.K2b a letter and a positive whole number
- 3.3.4.K3 identifies points as ordered pairs in the first quadrant of a coordinate plane (coordinate grid) (3.2.4.K1a).
- 3.3.4.A1 solves real-world problems using coordinate planes (coordinate grids) and map grids that have positive whole number and letter coordinates (3.2.4.A1a)
 e.g., identifying locations on a map or giving and following directions to move from one location to another.

Standard - 4: Data

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

Grade 3 Benchmarks

- 3.4.1 Probability - The student applies the concepts of probability to draw conclusions and to make predictions and decisions including the use of concrete objects in a variety of situations.
- 3.4.1.K1 recognizes any outcome of a simple event in an experiment or simulation as impossible, possible, certain, likely, unlikely, or equally likely (3.2.4.K1g)
- 3.4.1.K2 **S** lists some of the possible outcomes of a simple event in an experiment or simulation including the use of concrete objects (3.2.4.K1g-h)
- 3.4.1.A1 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 (3.2.4.A1g-h).
- 3.4.1.A2 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 (3.2.4.A1g).
- 3.4.2 Statistics - The student collects, organizes, displays, explains, and interprets numerical (whole numbers) and non-numerical data sets including the use of concrete objects in a variety of situations.
- 3.4.2.K1 organizes, displays, and reads numerical (quantitative) and non-numerical (qualitative) data in a clear, organized, and accurate manner including a

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- title, labels, categories, and whole number intervals using these **data displays** (3.2.4.K1h)
- 3.4.2.K1a graphs using concrete objects
 - 3.4.2.K1b pictographs with a whole symbol or picture representing one, two, five, ten, twenty-five, or one-hundred (no partial symbols or pictures)
 - 3.4.2.K1c frequency tables (tally marks)
 - 3.4.2.K1d horizontal and vertical bar graphs
 - 3.4.2.K1e Venn diagrams or other pictorial displays
 - 3.4.2.K1f line plots
 - 3.4.2.K1g charts and tables
 - 3.4.2.K2 collects data using different techniques (observations, polls, surveys, or interviews) and explains the results (3.2.4.K1h)
 - 3.4.2.K3 **S** finds these statistical measures of a data set with less than ten data points using whole numbers from 0 through 1,000 (3.2.4.K1a)
 - 3.4.2.K3a **S** minimum and maximum data values
 - 3.4.2.K3b **S** range
 - 3.4.2.K3c **S** mode
 - 3.4.2.K3d **S** median when data set has an odd number of data points
 - 3.4.2.A1 interprets and uses data to make reasonable inferences and predictions, answer questions, and make decisions from these **data displays** (3.2.4.A1h)
 - 3.4.2.A1a graphs using concrete objects
 - 3.4.2.A1b pictographs with a whole symbol or picture representing one, two, five, ten, twenty-five, or one-hundred (no partial symbols or pictures)
 - 3.4.2.A1c frequency tables (tally marks)
 - 3.4.2.A1d horizontal and vertical bar graphs
 - 3.4.2.A1e Venn diagrams or other pictorial displays
 - 3.4.2.A1f line plots
 - 3.4.2.A1g charts and tables
 - 3.4.2.A2 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 (3.2.4.A1a)
 - 3.4.2.A2a minimum and maximum data values
 - 3.4.2.A2b range
 - 3.4.2.A2c mode
 - 3.4.2.A2d median when data set has an odd number of data points

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- 3.4.2.A3 recognizes that the same data set can be displayed in various formats including the use of concrete objects (3.2.4.A1h)