

## Course/Grade Level: Grade Four Math Curriculum

**Focus:** Students will apply strategies to solve multi-digit multiplication and division, organize and display data, solve equations, and apply these skills to solve real-world problems.

### **M.4.1 Students will model and explain numbers for whole numbers, money, fractions, and decimals. Students will...**

- M.4.1.1 know, explain, and use numbers from 0 through 100,000; fractions (halves, fourths, thirds, eighths, tenths, twelfths, sixteenths, hundredths, and mixed numbers); and money (using decimals). (4.1.1.K.1)
- M.4.1.2 ▲ read, write, identify, and model numbers using numerals, words, and expanded notation from hundredths place through one hundred thousands place. (4.1.2.K1)
- M.4.1.3 read, write, and identify place value from hundredths place through one hundred thousands. (4.1.2.K2)
- M.4.1.4 classify, know, and explain a variety of whole numbers, fractions/mixed numbers, or decimals. (4.1.2.K2)
- M.4.1.5 state the reason for using whole numbers, fractions, mixed numbers, or decimals when solving real-world problems. (4.1.3.A.3)

**M.4.2 Students will explain and use the whole number properties and use estimation when needed. Students will...**

- M.4.2.1 ▲ use the concepts of these properties with the whole number system and demonstrate their meaning (including the use of concrete objects):
- a. commutative properties of addition and multiplication
  - b. zero property of addition (additive identity) and property of one for multiplication (multiplicative identity)
  - c. associative properties of addition and multiplication
  - d. symmetric property of equality applied to addition and multiplication  
e.g.,  $100 = 20 + 80$  is the same as  $20 + 80 = 100$
- (4.1.2.K5 a-d)**
- M.4.2.2 perform various computational methods (including solving real-world problems) with whole numbers from 0 through 10,000 with and without using place value models to show meaning; explain and use the concepts of these whole number properties:
- commutative properties of addition/multiplication
  - identity properties of addition/multiplication
  - associative properties of addition/multiplication
  - symmetric property - addition/multiplication
  - zero property of multiplication
- (4.1.2.A1,2)
- M.4.2.3 estimate real-world problems and use a variety of estimation strategies to estimate, adjust, and check to see if estimates are reasonable for whole numbers from 0 through 10,000; fractions; and money through \$1,000.
- M.4.2.4 recognize and explain the difference between an exact and an approximate answer, as well as use a variety of computational methods to perform real world problems with exact/approximate answers. e.g., When asked how many desks are in the room, the student gives an estimate of about 30, and then counts the desks and indicates an exact answer is 28 desks. (4.1.3.K.3, 4.1.3.A.4)

### M.4.3 Students will perform computation using a variety of methods.

Students will . . .

- M.4.3.1 use real-world problems to:
- compare (using the equality/inequality symbols and their meanings), order, and explain 0 through 100,000
  - add/subtract 0 through 10,000, money (using decimals), and fractions
  - multiply (2 digits by 1 digit)
- (4.1.1A1,2, 4.1.1.K.2, 4.2.2.K3)
- M.4.3.2 add and subtract whole numbers from 0 through 10,000 using various computational methods (paper and pencil, concrete materials, mental math, and technology). (4.1.4.K.1)
- M.4.3.3 identify and explain the meanings of factors/multiples and state and use multiplication/division facts from 1s through 12s. (4.1.4.K.2)  
*focus on the facts for the 6s through the 9s, 11s, 12s*
- M.4.3.4 read and write horizontally, vertically, and with different operational symbols the same addition, subtraction, multiplication, or division expression.
- M.4.3.5 ▲ **N** show the relationship between these operations with the basic fact families (addition facts with sums from 0 through 20 and corresponding subtraction facts, multiplication facts from 1 x 1 through 12 x 12 and corresponding division facts) including the use of mathematical models:
- a. addition and subtraction
  - b. addition and multiplication
  - c. multiplication and division
  - d. subtraction and division
- (4.1.4.K6 a-d)**
- M.4.3.6 solve these computation problems:
- add or subtract whole numbers from 0 through 100,000
  - multiply through a three-digit whole number by a two-digit whole
  - multiply whole-dollar money by a one- or two-digit whole number
  - multiply money amounts less than \$100 by whole numbers less than
  - divide through a four-digit number by a one-digit number
  - add/subtract fractions greater than or equal to zero with like
  - figure correct change through \$20
- (4.1.4.K3)
- M.4.3.7 ▲ solve one- and two-step real world problems with one or two operations using these computational procedures:
- a. add/subtract whole numbers from 0 through 10,000 and money
  - b. multiply through a two-digit number by a two-digit whole number
  - c. multiply whole dollars (up through three digits) by a one- or two-digit whole number
  - d. multiply money less than \$100 by whole numbers less than ten
  - e. figure correct change through \$20
- (4.1.4.A 1a-e)**

**M.4.4 Students will explain patterns and solve algebraic equations. Students will...**

- M.4.4.1 recognize and explain the following patterns using a written description for counting numbers related to number theory:
- whole number patterns
  - geometrical shapes
  - measurement, money, time
  - size, shape, color, texture, or movement
  - recognize multiple representations of the same patterns using (4.2.1.A1, 2, K4)
- M.4.4.2 know, explain, and solve real-world problems using variables and symbols to represent unknown quantities from 0 through 1,000. e.g. "How many weeks in twenty-eight days?" can be represented by  $n \times 7 = 28$  or  $n = 28/7$ .
- M.4.4.3 ▲ solve one-step equations using whole numbers with one variable and a whole number solution that:
- a. find the unknown in a multiplication or division equation based on multiplication/division facts from the 1s through 12s
  - b. find the unknown in a money equation using multiplication and division based upon addition and subtraction facts with values through \$10
  - c. find the unknown in a time equation involving whole minutes, hours, days, and weeks with values through 200
- (4.2.2.K2a-c)
- M.4.4.4 read, write, and describe whole equations and inequalities using mathematical vocabulary and notation. (4.2.2.K4)
- M.4.4.5 ▲ find the values, determine the rule, and state the rule using symbolic notation with one operation of whole numbers from 0 through 200 using a horizontal or vertical function table (input/output machine, T-table). (4.2.3.K2)
- M.4.4.6 ▲ represent and describe mathematical representations between whole numbers from 0 through 1000 using concrete objects, pictures, written descriptions, symbols, equations, tables, and graphs. (4.2.3.A1)

**M.4.5 Students will demonstrate and solve geometrical problems. Students will...**

- M.4.5.1 ▲ identify and plot points as whole number ordered pairs in the first quadrant of a coordinate plane (coordinate grid). **(4.3.4.K3)**
- M.4.5.2 recognize, describe, and identify squares, rectangles, rhombi, parallelograms, trapezoids as special quadrilaterals; and identify three dimensional figures (rectangular prisms, cylinders). (4.3.1.K5, 4.3.3.K3)
- M.4.5.3 solve real world problems by applying the properties of:
- plane figures (circles, squares, rectangles, triangles, ellipses, rhombi, parallelograms, hexagons) and lines of symmetry
  - solids (cubes, rectangular prisms, cylinders, cones, spheres)
- (4.3.1.A1)
- M.4.5.4 ▲ identify the plane figures (circles, squares, rectangles, triangles, ellipses, rhombi, octagons, hexagons, pentagons, trapezoids) used to form a composite figure. **(4.3.1.A2)**
- M.4.5.5 recognize and draw points, lines (intersecting, parallel, perpendicular), line segments, and rays; and lines of symmetry of geometric shapes and real-world objects. (4.3.1.K5, 6, A1)

## **M.4.6 Students will estimate and measure using various units of measure.**

Students will ...

- M.4.6.1 ▲ estimate to check whether or not measurements and calculations for length, width, weight, volume, temperature, time and perimeter in real-world problems are reasonable. **(4.3.2.A.2)**
- M.4.6.2 use and determine whole number estimations and adjust these estimations while solving real-world problems for length, width, weight, volume, temperature, time, perimeter and area using standard/nonstandard units of measure. (4.3.2.K1, A3)
- M.4.6.3 ▲ select, explain the selection of, use measurement tools, units of measure and degree of accuracy appropriate for a given situation to measure:
- length, width, height to nearest fourth of an inch or to the nearest centimeter
  - volume to nearest cup, pint, quart, gallon, or liter; or to the nearest whole unit of a non-standard unit of measure
  - weight to nearest ounce and pound or to the nearest whole unit of a non-standard unit of measure
  - temperature to nearest degree
  - time including elapsed time
- (4.3.2.K2a-e)**
- M.4.6.4 solve real-world problems involving standard/nonstandard units of measure with length, width, height, volume, weight, temperature, time and elapsed time. (3.2.A1)
- M.4.6.5 state or solve the number of:
- ounces in a pound, milliliters in a liter, grams in a kilogram, meters in a kilometer
  - number of items in a dozen, time, elapsed time
  - weeks in a year, months in a year, minutes in a hour
- (4.3.2.K.3, A1)
- M.4.6.6 convert inches and feet, feet and yards, inches and yards, cups and pints, pints and quarts, quarts and gallons, and centimeters and meters. (4.3.2.K4)
- M.4.6.7 find, know, and apply the perimeter of two-dimensional figures given the measures of all sides; and the area of squares and rectangles using concrete objects. (4.3.2.K5)

**M.4.7 Students will demonstrate transformations and locate points on coordinate planes.** Students will ...

- M.4.7.1 describe and use a transformation using cardinal points or positional directions and move these from one location to another on a map or grid.
- M.4.7.2 ▲ recognize, perform, and describe one transformation (reflection/flip, rotation/turn, translation/slide) on a two-dimensional figure or concrete object. **(4.3.3.K2)**
- M.4.7.3 recognize real-world transformations. (4.3.3.A1)
- M.4.7.4 solve real-world problems that involve distance and location using coordinate planes and map grids with positive whole numbers and letter coordinates. (4.3.4.A1)

**M.4.8 Students will organize data and solve data and probability questions.** Students will ...

- M.4.8.1 recognize and state the probability of an impossible event is zero and that the probability of a certain event is one (show on number line); as well as find the probability of a simple event in an experiment or situation. (4.4.1.K1, 3)
- M.4.8.2 ▲ organize, display, and read 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:
  - a. pictographs (with symbols or pictures representing one, two, five, ten, twenty-five, or one hundred including partial symbols when the symbol represents an even amount)
  - b. frequency tables (tally marks)
  - c. horizontal and vertical bar graphs
  - d. Venn diagrams or other pictorial displays
  - e. line plots
  - f. charts and tables
  - g. line and circle graphs**(4.4.2K1b-i)**
- M.4.8.3 interpret and solve questions based on information from graphs, line plots, charts, and tables. (4.4.2.A1)
- M.4.8.4 ▲ use these statistical measures of a data set using whole numbers from 0 through 1,000 with less than ten whole numbers data points to make reasonable inferences and predictions, answer questions, and make
  - a. minimum and maximum values
  - b. range
  - c. mode
  - d. median (when the data set has an odd number of data points)
  - e. mean (when the data set has a whole number mean)**(4.2.A2a-e)**