

# FOURTH GRADE MATH

*By the end of 4th Grade a student will be able to . . .*

## **NUMBERS**

- determine if a number is prime, through 100 (only a number with 1 and itself as factors are prime)
- explore numbers less than zero by extending a number line and through familiar applications (e.g., looking at sub-zero temperatures)
- select and use one of various algorithms to multiply and divide
- explore and describe classes of numbers (e.g., prime numbers, multiples that end in 0, etc.) according to characteristics such as factors and multiples

## **MEASUREMENT & GEOMETRY**

- measure with a greater degree of accuracy
- convert U.S. customary measurements into larger or smaller units with the help of conversion charts
- convert linear metric measurements into larger or smaller units with the help of a conversion chart
- identify polygons and non-polygons of various kinds, understand their similarities and differences, and label their parts
- explore polyhedra (3D objects) using concrete models
- create an accurate representation of a polygon with a given perimeter or area
- develop and discuss strategies for estimating the perimeters, areas, and volumes of regular and non-regular shapes
- determine the volume of a cube or rectangular prism using concrete materials
- develop and use common referents for volume, weight/mass, capacity, area, and angle measures to make comparisons and estimates
- measure angles using a protractor or angle ruler and select and apply appropriate standard units and tools to measure the size of angles
- construct a circle with a specified radius or diameter using a compass

## **MONEY AND TIME**

- solve problems using money (e.g., adding up the costs of food at a grocery store, figuring out change)
- solve problems using time (e.g., figuring out how much time has passed)

## **APPLYING MATH, PROBLEM-SOLVING, GRAPHING**

- solve multi-step (two or three step) number sentences and word problems using whole numbers and the four basic operations (addition, subtraction, multiplication, division)
- develop and use strategies (e.g., front-end estimation) to estimate the results of whole-number computations and to judge the reasonableness of results
- describe the relationship between two sets using “>” (greater than), “<” (less than), and “=” (equal to)
- solve problems with whole numbers using appropriate number properties (e.g.,  $7*8 = 8*n$ ,  $n = 7$  because of the commutative property of multiplication)
- explain the thinking used to solve a problem, make and test conjectures about mathematical properties and relationships, and justify the conclusions (e.g., Can you make a triangle from any 3 line segments or pieces of straw? Show and tell why or why not)
- organize data into graphs or tables and evaluate different formats for presenting data
- analyze and work with data in graphs or tables to draw conclusions and make predictions
- determine the minimum value, maximum value, range, mode, and median for a given data set
- collect data using observations and experiments, make predictions from data, and verify with further investigation
- list all possible outcomes of a single event and tell whether an outcome is certain, impossible, likely, or unlikely
- read and plot ordered pairs of numbers in the positive quadrant of the Cartesian plane

## **DECIMALS, FRACTIONS, PERCENTAGES**

- represent, order, and compare decimals to demonstrate understanding of the place value structure in the base-ten number system, to thousandths
- recognize equivalent representations for decimals and generate them (e.g., two-tenths =  $0.2 = \frac{2}{10}$ )
- develop and use a variety of strategies to estimate the sum or difference of a number sentence containing decimals
- represent fractions as parts of unit wholes (e.g.,  $\frac{4}{5}$  of a pie), as parts of a set (e.g.,  $\frac{4}{5}$  of ten objects), as locations on a number line, and as divisions of whole numbers (e.g., how many  $\frac{1}{2}$ 's are in 5?)
- solve addition or subtraction number sentences and word problems using fractions with like denominators
- determine 50% and 100% of a given group in context

## **PATTERNS, FUNCTIONS, ALGEBRA**

- recognize and work with number patterns of increasing complexity (e.g., if I have a “function machine” and I put in 2 and 4 comes out, then I put in 3 and 6 comes out, I can assume my machine doubles the input to get the output)
- create a table that describes a function rule for a single operation (e.g., What’s my rule?)
- demonstrate, in simple situations, how a change in one quantity results in a change in another quantity (e.g., increase the measure of the side of a square and the perimeter increases)
- identify situations with varying rates of change using words, tables, and graphs (e.g., growth of a plant)
- solve one-step linear equations with one missing value in isolation and in problem solving situations (7 bags of marbles cost \$56; how much does each bag cost?)