

# 1<sup>ST</sup> GRADE MATHEMATICS

## CURRICULUM GUIDE

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### BIG IDEAS

- ◆ Whole numbers can be compared and ordered according to groups of units and tens.
  - ◆ The operations of addition and subtraction are based on counting and allow us to more efficiently solve arithmetic problems.
  - ◆ Addition and subtraction are inverse operations.
  - ◆ Numeric symbols, representing concrete objects, can be added and subtracted.
  - ◆ There are many interrelated ways to add and subtract numbers.
  - ◆ Geometric attributes and properties determine how objects are different and alike.
  - ◆ New shapes can be created by either composing or decomposing existing shapes.
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### THEMATIC FOCUS

- ◆ Math classrooms are lively places for learning where students receive a rich diet of the following:
    - The use of mathematics to *solve problems*.
    - Application of *logical reasoning* to justify procedures and solutions.
    - Design and analyze multiple *representations*, make *connections* in and out of school.
    - See the National Council of Teachers of Mathematics (NCTM) [PRINCIPLES & STANDARDS FOR SCHOOL MATHEMATICS](#) for further information.
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### UNITS OF STUDY

- ◆ Whole Numbers
  - ◆ Number Words
  - ◆ Counting and Grouping Objects
  - ◆ Tens and Ones
  - ◆ Coin Value-Pennies, Nickels, and Dimes
  - ◆ Addition and Subtraction-Sums to 10
  - ◆ Number Patterns
  - ◆ Shape Attributes
  - ◆ Congruent and Symmetrical Shapes
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### CONCEPTS AND SKILLS

It is essential that the following concepts and skills be addressed in contexts that promote problem solving, reasoning, communication, making connections and designing and analyzing representations. See [FOCAL POINTS](#) for more information about grade level content for mathematics.

#### 1.1 Number and Operations: Develop an understanding of whole number relationships, including grouping in tens and ones

- Compare and order whole numbers to 100. (1.1.1)
- Represent whole numbers on a number line, demonstrating an understanding of the sequential order of the counting numbers and their relative magnitude. (1.1.2)
- Count and group objects in tens and ones. (1.1.3)
- Identify the number of tens and ones in whole numbers between 10 and 100, especially recognizing the numbers 10 to 19 as 1 group of ten and a particular number of ones. (1.1.4)
- Determine the value of collections of pennies, nickels, and dimes. (1.1.5)

**CONCEPTS AND SKILLS (CONTINUED)**

**1.2 Number and Operations and Algebra: Develop understandings of addition and subtraction and strategies for basic addition facts and related subtraction facts**

- Model 'part-whole,' 'adding to,' 'taking away from,' and 'comparing' situations to develop an understanding of the meanings of addition and subtraction. (1.2.1)
- Develop and use efficient strategies for adding and subtracting whole numbers using a variety of models, including discrete objects, length-based models (e.g., lengths of connecting cubes) and number lines. (1.2.2)
- Apply with fluency sums to 10 and related subtraction facts. (1.2.3)
- Use the concept of commutative [ $4 + 2 = 2 + 4$ ], associative [ $(4 + 3) + 7 = 4 + (3 + 7)$ ], and identity [ $0 + 3 = 3$ ] properties of addition to solve problems involving basic facts. (1.2.4)
- Relate addition and subtraction as inverse operations. (1.2.5)
- Identify, create, extend, and supply a missing element in number patterns involving addition or subtraction by a single-digit number. (1.2.6)

**1.3 Geometry: Compose and decompose two-and three-dimensional geometric shapes**

- Describe geometric attributes of shapes (e.g., round, corners, sides) to determine how they are alike and different. (1.3.1)
- Recognize and create shapes that are congruent or have symmetry. (1.3.2)
- Compose and decompose shapes (e.g., cut a square into two right triangles and put two cubes together to make a rectangular prism), thus building an understanding of part-whole relationships as well as the properties of the original and composite shapes. (1.3.3)
- Recognize shapes when viewed from different perspectives and orientations. (1.3.4)

◆ **1<sup>st</sup> Grade Connections**

The following connections to the concepts and skills bring in other important topics in meaningful ways. For example, the grade 2<sup>ND</sup> Grade Connections highlight the fact that the measurement focal point for grade 2 ("Developing an understanding of linear measurement and facility in measuring lengths") includes work with applications and models using the shapes from the geometry focal point for grade 1 ("Composing and decomposing geometric shapes"). At the same time, students in grade 2 continue to use vocabulary and spatial reasoning that will be essential for learning the content specified in the geometry focal point for grade 3 ("Describing and analyzing properties of two-dimensional shapes"). Because a curriculum that is integrated and internally connected (see [FOCAL POINTS OVERVIEW](#) for additional information) in this way uses related concepts and skills to support and enrich one or more focal points at a grade level, it has the potential to maximize students' learning.

- Numbers and Operations and Algebra
  - Two digit and subtraction
- Measurement and Data Analysis
  - Using standard and non-standard units of measurement
  - Number lines
  - Representing measurements and discrete data in pictures and bar graphs
  - Tell time in increments of hour and half hour.
- Algebra
  - Number patterns and properties
  - Odd and even numbers
  - Zero as the identity element for addition

◆ **Math Work Samples & Assessment** (see [Assessment](#) section for math scoring guides, sample tasks, and additional information)

◆ **Problem Solving** (see [Problem Solving](#) section for definitions, grade level descriptions, and instructional resources)

◆ **Math Placement** (see [Placement](#) section for course flowcharts, placement criteria, and additional information)

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**ESSENTIAL QUESTIONS**

- ◆ What are numbers? How do we use numbers?
- ◆ How are numbers alike and different?
- ◆ What shapes do you know? How are shapes used in the world around us?
- ◆ How can new shapes be made by composing or decomposing geometric shapes?

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**ESSENTIAL SKILLS**

- ◆ Apply mathematics in a variety of settings
  - Interpret a situation and apply workable mathematical concepts and strategies, using appropriate technologies where applicable.
  - Produce evidence, such as graphs, data, or mathematical models, to obtain and verify a solution.
  - Communicate and defend the verified process and solution, using pictures, symbols, models, narrative or other methods.
  - See [ESSENTIAL SKILLS](#) for more information about ODE requirements.