

## KINDERGARTEN MATHEMATICS

### CURRICULUM GUIDE

---

#### BIG IDEAS

- ◆ Counting and numbers tell how many or how much.
  - ◆ Sets of objects and the numerals associated with those sets can be compared to determine which is more or less.
  - ◆ Sets can be combined and separated to solve problems.
  - ◆ Sequential and growing patterns are all around us in the everyday world.
  - ◆ Different shapes and their properties can be described mathematically.
  - ◆ Shapes can be combined or partitioned to create new shapes.
  - ◆ A measurement is a comparison of one object with the size of another.
  - ◆ Objects can be sorted by measurable and non-measurable attributes.
- 

#### 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.
- 

#### UNITS OF STUDY

- ◆ Counting
  - ◆ Reading and writing numbers
  - ◆ Comparing numbers
  - ◆ Combining and separating sets
  - ◆ Patterns: repeating and growing
  - ◆ 2-D shapes
  - ◆ 3-D shapes
  - ◆ Using shapes in the environment
  - ◆ Sorting by attributes
  - ◆ Comparing lengths
- 

#### 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.

#### **K.1 Number and Operations and Algebra: Represent, compare, and order whole numbers, and join and separate sets**

- Read and write whole numbers to 10. (K.1.1)
- Connect numbers, including written numerals, to the quantities they represent, using various physical models and representations. (K.1.2)
- Count forward by ones beginning with any number less than 30; count backward by ones beginning with any number 10 or less. (K.1.3)
- Recognize the number of objects in a small set (such as the arrangements of dots on a number cube) without counting. (K.1.4)
- Count objects in a set using one-to-one correspondence and produce sets of given sizes. (K.1.5)
- Compare and order sets or numerals by using both cardinal and ordinal meanings. (K.1.6)

**CONCEPTS AND SKILLS (CONTINUED)**

- Model simple joining and separating situations and represent them with objects, pictures, and/or numerals. (K.1.7)
- Choose, combine, and apply effective strategies for solving joining and separating problems. (K.1.8)
- Identify, duplicate, and extend simple number patterns and sequential and growing patterns (e.g., patterns made with shapes). (K.1.9)

**K.2 Geometry: Describe shapes and space**

- Identify, name, and describe basic two-dimensional shapes (e.g., square, circle, triangle, rectangle, regular hexagon) presented in a variety of ways (e.g., with different sizes or orientations). (K.2.1)
- Identify, name, and describe basic three-dimensional shapes (e.g., sphere, cube, and cylinder). (K.2.2)
- Use basic shapes and spatial reasoning to describe and model objects in their environment, and to construct more complex shapes. (K.2.3)

**K.3 Measurement: Compare and order objects by attributes**

- Identify the measurable attributes (e.g., length, weight) and non-measurable attributes (e.g., color) of an object. (K.3.1)
- Compare, sort, and order objects according to measurable (e.g., longest to shortest, lightest to heaviest) and non-measurable (e.g., color, texture) attributes. (K.3.2)
- Compare the lengths of two objects both directly (by comparing them with each other) and indirectly (by comparing both with a third object). (K.3.3)

◆ **Kindergarten 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.

- Data Analysis
  - Collect data and use to answer questions
- Geometry
  - Integrate understandings of geometry, measurement, and number. (Ex: create simple navigational directions.)

◆ **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)

---

**ESSENTIAL QUESTIONS**

- ◆ What are numbers? How are they used?
- ◆ What do more and less mean? What are some ways to show that something is more or less?
- ◆ What is adding and subtracting? Why do numbers need to be added or subtracted?

**ESSENTIAL QUESTIONS (CONTINUED)**

- ◆ What is a pattern? How are they made?
  - ◆ What are some shapes? How can these shapes be described without naming them?
  - ◆ How can you tell if one object is longer than another? How can the length of three objects be compared?
  - ◆ How many different ways can a group of objects be sorted? Why are the objects in different groups?
- 

**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.