

## Kindergarten

The following curriculum focal points and related connections are the recommended content emphases for mathematics in kindergarten. It is essential that these focal points be addressed in contexts that promote problem solving, reasoning, communication, making connections, and designing and analyzing representations.

### Kindergarten Curriculum Focal Points

#### **Number and Operations: Representing, comparing, and ordering whole numbers and joining and separating sets**

Children use numbers, including written numerals, to represent quantities and to solve quantitative problems, such as counting objects in a set, creating a set with a given number of objects, comparing and ordering sets or numerals by using both cardinal and ordinal meanings, and modeling simple joining and separating situations with objects. They choose, combine, and apply effective strategies for answering quantitative questions, including quickly recognizing the number in a small set, counting and producing sets of given sizes, counting the number in combined sets, and counting backward.

#### **Geometry: Describing shapes and space**

Children interpret the physical world with geometric ideas (e.g., shape, orientation, spatial relations) and describe it with corresponding vocabulary. They identify, name, and describe a variety of shapes, such as squares, triangles, circles, rectangles, (regular) hexagons, and (isosceles) trapezoids presented in a variety of ways (e.g., with different sizes or orientations), as well as such three-dimensional shapes as spheres, cubes, and cylinders. They use basic shapes and spatial reasoning to model objects in their environment and to construct more complex shapes.

#### **Measurement: Ordering objects by measurable attributes**

Children use measurable attributes, such as length or weight, to solve problems by comparing and ordering objects. They compare the lengths of two objects both directly (by comparing them with each other) and indirectly (by comparing both with a third object), and they order several objects according to length.

### Connections to the Focal Points

**Data Analysis:** Children sort objects and use one or more attributes to solve problems. For example, they might sort solids that roll easily from those that do not. Or they might collect data and use counting to answer such questions as, “What is our favorite snack?” They re-sort objects by using new attributes (e.g., after sorting solids according to which ones roll, they might re-sort the solids according to which ones stack easily).

**Geometry:** Children integrate their understandings of geometry, measurement, and number. For example, they understand, discuss, and create simple navigational directions (e.g., “Walk forward 10 steps, turn right, and walk forward 5 steps”).

**Algebra:** Children identify, duplicate, and extend simple number patterns and sequential and growing patterns (e.g., patterns made with shapes) as preparation for creating rules that describe relationships.

## **Related Expectations from Principles and Standards for School Mathematics Content Standards: Kindergarten**

The following content expectations are linked to the [Kindergarten focal points](#) or connections.

### **Number and Operations**

- Count with understanding and recognize “how many” in sets of objects
- Develop understanding of the relative position and magnitude of whole numbers and of ordinal and cardinal numbers and their connections
- Connect number words and numerals to the quantities they represent, using various physical models and representations

### **Algebra**

- Sort, classify, and order objects by size, number, and other properties
- Analyze how both repeating and growing patterns are generated
- Use concrete, pictorial, and verbal representations to develop an understanding of invented and conventional symbolic notations
- Describe qualitative change, such as a student’s growing taller

### **Geometry**

- Recognize, name, build, draw, compare, and sort two- and three-dimensional shapes (naming of three-dimensional shapes occurs in Grade 5 Curriculum Focal Points)
- Describe attributes and parts of two- and three-dimensional shapes
- Describe, name, and interpret relative positions in space and apply ideas about relative position
- Describe, name, and interpret direction and distance in navigating space and apply ideas about direction and distance
- Find and name locations with simple relationships such as “near to” and in coordinate systems such as maps (this use of coordinate systems is not identified as a focal point or connection)

- Create mental images of geometric shapes using spatial memory and spatial visualization
- Recognize geometric shapes and structures in the environment and specify their location

### Measurement

- Recognize the attributes of length, volume, weight, area, and time (time is not identified as a focal point or connection)
- Compare and order objects according to these attributes

### Data Analysis and Probability

- Pose questions and gather data about themselves and their surroundings
- Sort and classify objects according to their attributes and organize data about the objects
- Describe parts of the data and the set of data as a whole to determine what the data show

