

## Grades 3–5: Geometry

**STANDARD I.** Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

**EXPECTATION A.** Identify, compare, and analyze attributes of two- and three-dimensional shapes and develop vocabulary to describe the attributes.

3	4	5
*1. Using appropriate vocabulary, identify and describe attributes of polygons including triangles, quadrilaterals (rectangles, squares, other parallelograms, trapezoids), pentagons, hexagons, and octagons.  *2. Using appropriate vocabulary, describe properties of circles (center, radius, and diameter).  *3. Using appropriate vocabulary, identify and describe attributes of three-dimensional shapes including prisms, pyramids, spheres, cones, and cylinders.	*1. Choose appropriate models of two- and three-dimensional shapes from descriptions of attributes.	1. Using models and appropriate vocabulary, compare and analyze attributes of polygons, attributes of polyhedra, and attributes of cones and cylinders.

**EXPECTATION B.** Classify two- and three-dimensional shapes according to their properties and develop definitions of classes of shapes such as triangles and pyramids.

3	4	5
1. Classify three-dimensional shapes according to their attributes.	*1. Classify triangles by lengths of sides (scalene, isosceles, and equilateral) and sizes of angles (acute, obtuse, and right).	*1. Using models and appropriate vocabulary classify quadrilaterals, polyhedra, cones, and cylinders according to their attributes.  2. Develop definitions for classes of two- and three-dimensional shapes.

**EXPECTATION** C. Investigate, describe, and reason about the results of subdividing, combining, and transforming shapes.

<b>3</b>	<b>4</b>	<b>5</b>
1. Combine two-dimensional shapes to form new shapes and draw conclusions about area and fractional relationships.	1. Subdivide two-dimensional shapes to form new shapes and draw conclusions about area and fractional relationships.	

**EXPECTATION** D. Explore congruence and similarity.

<b>3</b>	<b>4</b>	<b>5</b>
*1. Compare two-dimensional shapes to determine if they exactly match (congruency).		*1. Compare two-dimensional shapes to determine if they are similar by transformations of magnifying or shrinking.

**EXPECTATION** E. Make and test conjectures about geometric properties and relationships and develop logical arguments to justify conclusions.

<b>3</b>	<b>4</b>	<b>5</b>
1. Using models, make and test conjectures about geometric properties and relationships and explain the conclusions.	1. Using models and mathematical vocabulary, make and test conjectures about geometric properties and relationships and explain the conclusions.	*1. Make and test conjectures about geometric properties and relationships and then develop logical arguments to justify the conclusions.

## **STANDARD**

### **II. Specify locations and describe spatial relationships using coordinate geometry and other representational systems.**

#### **EXPECTATION A. Describe location and movement using common language and geometric vocabulary.**

3	4	5
1. Give instructions (direction, distance, turns) for moving from one location to another.	1. Describe location and movement using common language and geometric vocabulary and illustrate both with and without technology.	

#### **EXPECTATION B. Make and use coordinate systems to specify locations and to describe paths.**

3	4	5
1. Specify locations on maps and grids using direction and distance.	*1. Investigate possible paths from one point to another along vertical and horizontal grid-lines. 2. Identify and name points on a coordinate grid using an ordered pair of whole numbers.	*1. Using ordered pairs of numbers, locate and name points in the first quadrant of a coordinate system.
*2. Locate points corresponding to given whole numbers on a number line.		

#### **EXPECTATION C. Find the distance between points along horizontal and vertical lines of a coordinate system.**

3	4	5
		*1. Find the distance between points in the first quadrant of a coordinate system along horizontal and vertical lines.

**STANDARD III. Apply transformations and use symmetry to analyze mathematical situations.**

**EXPECTATION A. Predict and describe the results of sliding, flipping, and turning two-dimensional shapes.**

<b>3</b>	<b>4</b>	<b>5</b>
	1. Using models, describe the results of translations (slides), reflections (flips), and rotations (turns).  2. Using models and technology, create simple tessellations.	*1. Predict the results of geometric motion of shapes including combinations of translations (slides), reflections (flips), and rotations (turns).

**EXPECTATION B. Describe a motion or a series of motions that will show that two shapes are congruent.**

<b>3</b>	<b>4</b>	<b>5</b>
1. Use slides, flips, and turns informally with models to determine whether or not two shapes are congruent.	*1. Draw two-dimensional shapes that are related by translation (slide) or reflection (flip).  2. Given a shape and its translation (slide) or reflection (flip), describe the motion that has been applied.	1. Describe series of motions that may be used to show that two shapes are congruent.

**EXPECTATION C. Identify and describe line and rotational symmetry in two- and three-dimensional shapes and designs.**

<b>3</b>	<b>4</b>	<b>5</b>
*1. Identify and describe the line symmetry of two-dimensional shapes.		*1. Determine whether given two-dimensional shapes and designs have rotational symmetry. 2. Investigate and describe symmetry and congruence of shapes drawn on a grid.

**STANDARD** IV. Use visualization, spatial reasoning, and geometric modeling to solve problems.

**EXPECTATION** A. Build and draw geometric objects.

3	4	5
*1. Create representations of points, lines (intersecting, perpendicular, and parallel), line segments (including intersecting and parallel), rays, and angles in a plane. *2. Build and draw two-dimensional geometric objects.	*1. Draw and label representations of points, lines, line segments, rays, and angles, using mathematical notation.	*1. Build and draw three-dimensional objects.

**EXPECTATION** B. Create and describe mental images of objects, patterns, and paths.

3	4	5
1. Identify two-dimensional shapes given a verbal description. 2. Describe the path that results from following specific directions in moving from one location to another.	*1. Write a description of a given three-dimensional object. 2. Describe a path along grid lines from one point to another. 3. Given a verbal description, draw two- or three-dimensional objects.	*1. Sketch the front, top, and side views of a model of a three-dimensional shape built with cubes.

**EXPECTATION** C. Identify and build a three-dimensional object from two-dimensional representations of that object.

3	4	5
1. Identify and build a cube from its two-dimensional representation (net).	*1. Identify and build rectangular prisms and cylinders from a given two-dimensional representation (net).	

**EXPECTATION D. Identify and build a two-dimensional representation of a three-dimensional object.**

<b>3</b>	<b>4</b>	<b>5</b>
1. Identify and build a two-dimensional representation (net) of a cube.	1. Identify and build a two-dimensional representation (net) of a given rectangular prism.	

**EXPECTATION E. Use geometric models to solve problems in other areas of mathematics, such as number and measurement.**

*For all three grade levels, refer to these concepts in the “Number and Operations” and the “Measurement” strands.*

**EXPECTATION F. Recognize geometric ideas and relationships and apply them to other disciplines and to problems that arise in the classroom or in everyday life.**

<b>3</b>	<b>4</b>	<b>5</b>
	1. Connect geometry to other areas of mathematics, to other disciplines, and to the world outside the classroom.	