


Reason with shapes and their attributes (Standards 1–3).	
Standard 1.G.1 Distinguish between defining attributes (<i>for example, triangles are closed and three-sided</i>) versus non-defining attributes (<i>for example, color, orientation, overall size</i>); build and draw shapes that possess defining attributes.	
Concepts and Skills to Master	
<ul style="list-style-type: none"> • Distinguish between examples of geometric shapes (closed figures) and non-geometric shapes (open figures) • Understand that defining attributes are those that determine the name of the shape (number of sides/angles, etc.) • Understand that non-defining attributes have no impact on the name of the shape (color, orientation, overall size, etc.) • Identify shapes (see Academic Vocabulary below for list of shapes) by their defining attributes as opposed to their non-defining attributes • Draw and build shapes (accuracy of drawings may be limited by a student’s fine motor skills; students are not expected to draw three-dimensional shapes) 	
Related Standards: Current Grade Level	Related Standards: Future Grade Levels
1.G.2 Compose 2-D and 3-D shapes to create composite shapes 1.G.3 Partition circles and rectangles into two and four equal shares	2.G.1 Recognize and draw shapes having specified attributes 3.G.1 Understand that shapes in different categories may share attributes, and that the shared attributes can define a larger category
Critical Background Knowledge from Previous Grade Levels	
<ul style="list-style-type: none"> • Correctly name shapes regardless of their orientations or overall sizes (K.G.2) • Analyze, compare, and sort two- and three-dimensional shapes (K.G.4) • Model and create shapes (K.G.5) • Students work with squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres in kindergarten 	
Academic Vocabulary	
square, circle, triangle, rectangle, hexagon, cube, cone, cylinder, sphere, flat, solid, two-dimensional, three-dimensional, build, create, draw, attribute, defining attribute, non-defining attribute, closed figure, sides, corners/vertices, straight, round Shapes new to first grade: trapezoid, half-circle, quarter-circle, rectangular prism	
Suggested Models	Suggested Strategies
 <p>Student may say, “I know that this shape is a triangle because it has 3 sides. It’s also closed, not open.”</p>	<ul style="list-style-type: none"> • Draw/reproduce shapes in the air, in sand, in clay, etc. or model with components such as geoboards, sticks, marshmallows, pipe cleaners, etc. given a defining attribute • Move flexibly between shape names, defining attributes, shape pictures, and physical shape models • View similar shapes represented in various orientations, sizes, colors. Discuss the similar defining attributes which allows shapes to be identified by their name, regardless of their non-defining attributes • Create student-generated rules for sorting shapes using defining attributes. Have students share sorting rules with classmates and provide additional examples that support their rules
Image source: http://www.dpi.state.nc.us/docs/curriculum/mathematics/scos/1.pdf	

Standard 1.G.2 Compose shapes.

- a. Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half circles, and quarter-circles) to create a composite shape, and compose new shapes from the composite shape.
- b. Compose three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape. First grade students do not need to learn formal names such as “right rectangular prism.”

Concepts and Skills to Master

- Create composite shapes (shapes built from more than one shape) made up of two or more geometric shapes
- Use composite shapes to create new composite shapes (add additional triangles to a rectangle created from two triangles to create a trapezoid, see below)
- Notice smaller shapes within a larger existing shape (see how two triangles make a square); relate composite shapes to part-whole relationships
- Describe properties of original and composite shapes using informal language such as corner, point, side, etc.
- Perceive a combination of shapes as a single new shape (identify a composite shape as a unit created from smaller units)

Teacher Note: This is a concrete standard. Students should informally explore combining physical objects through trial and error. Composing shapes supports measurement concepts and provides students with opportunities to informally examine attributes such as equal side lengths or angle sizes. Composing shapes supports composing and decomposing numbers (as six triangles compose a hexagon, ten ones compose a ten). Composing shapes also supports partitioning shapes for development of fraction understanding.

Related Standards: Current Grade Level

- 1.G.1** Build and draw shapes that possess defining attributes
- 1.G.3** Partition circles and rectangles into two and four equal shares; describe the shares as halves, fourths, and quarters
- 1.MD.2** Measure length by iteration

Related Standards: Future Grade Levels

- 2.G.2** Partition into rows and columns and count to find the total
- 2.G.3** Partition circles and rectangles into two, three, and four equal shares; describe the shares as halves, thirds, half of, etc.
- 3.G.2** Partition shapes into parts with equal areas and express the area of each part as a unit fraction of the whole

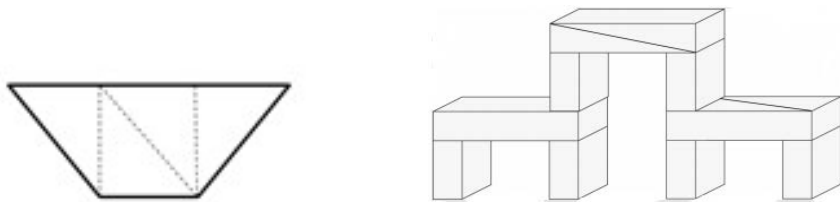
Critical Background Knowledge from Previous Grade Levels

- Compose simple shapes to form larger shapes (K.G.6)
- Identify and describe shapes, including squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres (K.G.1–3)

Academic Vocabulary

compose, two-dimensional, three-dimensional, rectangle, square, trapezoid, triangle, half circle, quarter-circle, cube, rectangular prism, cone, cylinder

Suggested Models



Suggested Strategies

- Use manipulatives such as pattern blocks, tangrams, paper shapes or blocks to create, build, and add to shapes
- Solve puzzles or create pictures from various two-dimensional and three-dimensional shapes

Image sources: http://commoncoretools.me/wp-content/uploads/2014/12/ccss_progression_gk6_2014_12_27.pdf
<http://www.ncpublicschools.org/docs/curriculum/mathematics/scos/1.pdf>

Standard 1.G.3 Partition circles and rectangles into two and four equal shares; describe the shares using the words halves, fourths, and quarters; and use the phrases half of, fourth of, and quarter of. Describe the whole as two or four of the shares. Understand that, for these examples, decomposing into more equal shares creates smaller shares.

Concepts and Skills to Master

- Recognize when shares are and are not equal
- Partition circles and rectangles into two equal shares or four equal shares
- Describe the whole as two shares when working with halves or as four shares when working with fourths/quarters
- Understand that the word halves is used to describe two equal shares that compose the whole (meaning that there are two parts and those two parts must be equal in size)
- Understand that the words fourths and quarters are used to describe four equal shares that compose the whole (meaning that there are four parts and those four parts must be equal in size)
- Reason that as the number of equal shares in the whole increases, the size of the share decreases (fourths/quarters are smaller than halves because the whole has been partitioned into more equal parts)

Teacher Note: Students need only explore fraction concepts using rectangles and circles. First grade students verbally use the words partition (not divide), halves, fourths, and quarters and the phrases half of, quarter of to describe their thinking. First grade students are not expected to use or recognize fraction notation (such as $\frac{1}{4}$). Fractional notation begins in third grade. Emphasis should be placed upon the relationship between the shares and the whole. Students should be given extensive opportunities to partition circles and rectangles rather than just identifying shares of pre-partitioned shapes.

Related Standards: Current Grade Level

- 1.G.2** Compose two- and three-dimensional shapes to create a composite shape
- 1.MD.3** Tell and write time in hours and half-hours

Related Standards: Future Grade Levels

- 2.G.3** Partition circles and rectangles into two, three, and four equal shares; describe the shares
- 3.NF.1** Understand unit fractions
- 3.NF.2** Understand a fraction as a number on the number line.
- 3.NF.3** Explain equivalence of fractions and compare fractions by reasoning about their size
- 3.G.2** Partition shapes into parts with equal areas and express each part as a unit fraction

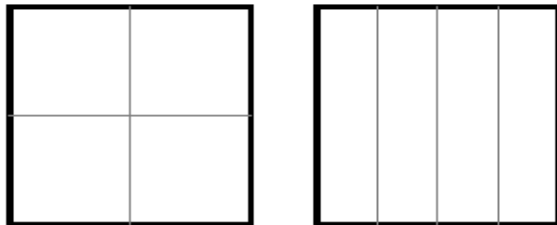
Critical Background Knowledge from Previous Grade Levels

- Compose simple shapes to form larger shapes (K.G.6)
- Identify and describe shapes including squares, circles, triangles, rectangles (K.G.1–3)
- Notice smaller shapes within a larger existing shape (see how two triangles make a square) (1.G.2)

Academic Vocabulary

circle, rectangle, partition, decompose, shares, equal shares, halves, fourths, quarters, half of, fourth of, quarter of, whole

Suggested Models



Suggested Strategies

- Partition regions into equal shares using a context (for example: cookies, pies, pizza, brownies, crackers, grass area)
- Sort shapes that are partitioned into equal shares and shares that are not equal
- Use manipulatives such as geoboards, paper rectangles and circles, food, etc. to partition shapes
- Use context to compare the relative size of halves and fourths (Would you rather have half of this candy bar or a fourth of the same candy bar?)