

Grade 1 Math Unit 7- Geometry

UNIT OVERVIEW

In grade 1, instructional focus should focus on four critical areas. This unit is connected to **Focus #4, Reasoning about attributes of, and composing and decomposing geometric shapes.**
(See Connections for further explanation)

There is 1 cluster within this unit:

- a. Reason with shapes and their attributes. * (See Connections for further explanation)

STANDARDS

CC_Common Core State Standards - Mathematics (2010) - Grade 1

Domain 1.G Geometry

Cluster Statement Reason with shapes and their attributes.

Standard 1.G.1 Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.

Standard 1.G.2 Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or 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.

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 of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.

CONTENT ELABORATIONS

1.G.1

1.G.1 calls for students to determine which attributes of shapes are defining compared to those that are non-defining. Defining attributes are attributes that must always be present. Defining attributes are attributes that help to define a particular shape (#angles, # sides, length of sides, etc.) Non-defining attributes are attributes that do not always have to be present. Non-defining attributes are attributes that do not define a particular shape (color, position, location, etc.) The shapes can include triangles, squares, rectangles and trapezoids. **1.G.2** includes half-circles and quarter circles. Ask students to determine which attributes of shapes are defining compared to those that are non-defining.

It is important that students are exposed to both regular and irregular shapes so that they can communicate defining attributes. Students should also use appropriate language to describe a given 3-D shape: # faces, # vertices/point, #edges. They should compare and contrast 2-D and 3-D figures using defining attributes.

MP.1, MP.7, MP.3, MP.4 should be emphasized.

1.G.2

1.G.2 calls for students to compose a 2-D or 3-D shape from two shapes. This standard includes shape puzzles in which students use objects (e.g., pattern blocks) to fill a larger region. The ability to describe, use and visualize the effect of composing and decomposing shapes is an important mathematical skill. It is not only relevant to geometry, but is related to children's ability to compose and decompose numbers. Students may use pattern blocks, plastic shapes, tangrams, or computer environments to make new shapes. The teacher can provide students with cutouts of shapes and ask them to combine them to make a particular shape. Students can make 3-D shapes with clay or dough, slice into two pieces (not necessarily congruent) and describe the two resulting shapes. For example, slicing a cylinder will result in two smaller cylinders.

MP.1, MP.4, MP.7 should be emphasized.

1.G.3	<p>1.G.3 is the first time students begin partitioning regions into equal shares using a context such as cookies, pies, pizza, etc. This is a foundational building block of fractions, which will be extended in future grades. Students should have ample experiences using the words, <i>halves, fourths, and quarters</i>, and the phrases <i>half of, fourth of, and quarter of</i>. Students should also work with the idea of the whole, which is composed of two halves, or four fourths or four quarters.</p> <p>Students need many experiences with different sized circles and rectangles to recognize that when they cut something into two equal pieces, each piece will equal one half of its original whole. Children should recognize that halves of two different wholes are not necessarily the same size. Also they should reason that decomposing equal shares into more equal shares results in smaller equal shares.</p> <p>MP.2, MP.3, MP.6, MP.7 should be emphasized.</p>
UNIT VOCABULARY	
two-dimensional shapes side vertex square rectangle triangle trapezoid	<div> circle composite shape whole equal part halves fourths </div> <div> three-dimensional shape cube rectangular prism face cone cylinder </div>
BIG IDEAS	
ENDURING UNDERSTANDINGS	ESSENTIALS QUESTIONS Choose a few questions based on the needs of your students

- The properties of shapes make them alike or different.
- Some shapes have sides, angles, and faces which can be counted.
- Equal means being of the same size, quantity, or value.

- What are attributes?
- How can shapes be sorted?
- How are shapes used in our world?
- What makes shapes different from each other?
- How can we group certain shapes together? Why do they belong together?
- How can I create a shape?
- How do shapes fit together and come apart?
- How can a shape be described?
- How do I organize shapes?
- Where can we find shapes in the real world?
- What is a 2-dimensional shape?
- What is a 3-dimensional shape?
- How are shapes alike and different?
- How can we divide shapes into equal parts?
- How can we be sure that we have equal parts?
- Why is it important to divide into equal parts?
- How can you show half of something?
- How do we know when parts are equal?
- What is half of a whole?
- What is a fourth of a whole?
- How can you divide shapes into halves and fourths?
- How can a quantity be shared?
- How can things be divided into equal parts?

CONNECTIONS

In **Critical Focus Area #4** students compose and decompose plane or solid figures (e.g., put two triangles together to make a quadrilateral) and build understanding of part-whole relationships as well as the properties of the original and composite shapes. As they combine shapes, they recognize them from different perspectives and orientations, describe their geometric attributes, and determine how they are alike and different, to develop the background for measurement and for initial understandings of properties such as congruence and symmetry.

* This cluster is connected to both clusters in the *Geometry* Domain in Kindergarten and to *Reason with shapes and their attributes* in Grade 2.

Standards for Mathematical Practice (SMP)

- MP.1** Make sense of problems and persevere in solving them
- MP.2** Reason abstractly and quantitatively
- MP.3** Construct viable arguments and critique the reasoning of others
- MP.4** Model with mathematics
- MP.5** Use appropriate tools strategically
- MP.6** Attend to precision
- MP.7** Look for and make use of structure (Deductive reasoning)
- MP.8** Look for and express regularity in repeated reasoning (Inductive Reasoning)

