

# Grade 2 Math Unit 7- Geometry

## UNIT OVERVIEW

In Grade 2, math instruction centers around 4 Critical Focus Areas. This unit will address Critical Focus Area #4, **Describing and analyzing shapes**. (See Connections for explanation)

This unit addresses 1 cluster:

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

## STANDARDS

### CC\_Common Core State Standards - Mathematics (2010) - Grade 2

#### Domain 2.G Geometry

*Cluster Statement Reason with shapes and their attributes.*

**Standard 2.G.1** Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.

**Standard 2.G.2** Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.

**Standard 2.G.3** Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.

## CONTENT ELABORATIONS

**2.G.1** **2.G.1** calls for students to identify and draw shapes based on a given set of attributes. These include triangles, quadrilaterals (squares, rectangles, and trapezoids), pentagons, hexagons and cubes. The shapes should appear as both regular (equal sides and equal angles) and irregular. Students use the vocab. word "angle" in place of "corner" but they do not need to name angle types. Shapes should be presented in a variety of orientations and configurations.  
**MP.2, MP.4, MP.5, MP.7** should be emphasized.

**2.G.2** **2.G.2.** calls for students to partition a rectangle into squares (or square-like regions) and then determine the total number of squares. This relates to the standard **2.OA.4** where students are arranging objects in an array of rows and columns. This standard is a precursor to learning about the area of a rectangle and using arrays for multiplication.  
**MP.2, MP.6, MP.8** should be emphasized.

**2.G.3** **2.G.3** calls for students to partition circles and rectangles into 2, 3, or 4 equal shares. Students should be given ample experiences to explore this concept with paper strips and pictorial representations. Students should also work with the vocabulary terms halves, thirds, half of, third of, and fourth (or quarter)of. While students are working on this standard, teachers should help them to make the connection that a "whole" is composed of two halves, three thirds and four fourths. This standard also addresses the idea that equal shares of identical wholes may not have the same shape. This standard introduces fractions in an area model. Students need experiences with different sizes, circles, and rectangles. It is important for students to see circles and rectangles partitioned in multiple ways so they learn to recognize that equal shares can be different shapes within the same whole.  
**MP.2, MP.3, MP.6, MP.8** should be emphasized.

## UNIT VOCABULARY

two-dimensional shape  
parallelogram  
trapezoid

cube  
sphere  
cone

vertex  
halves  
thirds

pentagon  
hexagon  
side  
angle  
quadrilateral  
three-dimensional shape

cylinder  
pyramid  
rectangular prism  
face  
edge

fourths  
partition  
half of  
third of  
fourth of

## BIG IDEAS

### ENDURING UNDERSTANDINGS

- identify plane figures and solid or hollow figures according to geometric properties
- describe plane figures and solid or hollow figures according to geometric properties
- develop an understanding of the relationship between solid or hollow figures and plane figures
- understand that the faces of solid or hollow figures are plane figures
- further develop spatial awareness of geometric solids and figures
- investigate what happens when geometric figures are combined
- investigate what happens when geometric figures are cut apart
- recognize plane and solid figures in the real world
- Repeatedly adding the same quantity or forming a rectangular array are strategies for repeated addition.
- Fractional parts are equal shares of a whole number, whole object, or a whole set.
- The more equal sized pieces that form a whole, the smaller the pieces (fraction) will be.
- When the numerator and denominator are the same number, the fraction equals the number one or one whole (entire object or set).
- The fraction name (half, third, fourth) indicates the number of equal parts in the whole.
- Equal shares of identical wholes may not have the same shape. For example, fourths can be represented in multiple ways (i.e. with diagonal, horizontal, vertical cuts) and although they look different they represent the same amount/size piece.

### ESSENTIALS QUESTIONS

Choose a few questions based on the needs of your students

- How do we describe geometric figures?
- Where can we find geometric figures in the world around us?
- How do we use the following terms: angle, vertex, face, side, and edge to describe geometric figures?
- How do we apply the use of fractions in everyday life?
- How do we know how many fractional parts make a whole?
- When is it appropriate to use fractions?

## CONNECTIONS

In Critical Area of Focus #4, students describe and analyze shapes by examining their sides and angles. Students investigate, describe, and reason about decomposing and combining shapes to make other shapes. Through building, drawing, and analyzing two- and three-dimensional shapes, students develop a foundation for understanding area, volume, congruence, similarity, and symmetry in later grades.

\*This cluster connects to Reason with shapes and their attributes in Grade 1, and to Develop understanding of fractions as numbers and Reason with shapes and their attributes in Grade 3.

**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)

**REASON WITH SHAPES AND THEIR ATTRIBUTES**

	CONTENT	SKILLS
A.	Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of faces.	Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of faces. 1. Identify the attributes of triangles, quadrilaterals, pentagons, hexagons, and cubes (e.g. faces, angles, sides, vertices, etc). 2. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes based on the given attributes. 3. Describe and analyze shapes by examining their sides and angles, not by measuring. 4. Compare shapes by their attributes (e.g. faces, angles). 5. Draw shapes with specified attributes.
B.	Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.	Partition a rectangle into rows and columns of same-size squares and count to find the total number of them. 1. Counts to find the total number of same-size squares. 2. Defines partition. 3. Identify a row. 4. Identify a column. 5. Determines how to partition a rectangle into same-size squares.
C.	Partition circles and rectangles into two, three, or four equal shares.	Partition circles and rectangles into two, three, or four equal shares. 1. Identify two , three and four equal shares of a whole. 2. Describe equal shares using vocabulary: halves, thirds, fourths half of, third of etc. 3. Describe the whole as two halves , three thirds, or four fourths. 4. Justify why equal shares of identical wholes need not have the same shape.

**UNIT RESOURCES**

Math Common Core State Standards

McGraw-Hill, **My Math** Chapter 12

Georgia Math Framework, Grade 2 Unit 5

Debbie Diller Math Work Stations materials and process

Manipulatives - including, but not exclusively: pattern blocks, snap cubes, counting disks, counting bears, a variety of counters, buttons, base ten blocks, dot dice, numeral dice, spinners, number cards, five and ten frames, dominoes