Grade 3 Math Unit 6- Geometry

UNIT OVERVIEW

In Grade 3, instructional time should focus on four critical areas. This unit addresses Critical Focus **Area #3, Developing understanding of the structure of rectangular arrays and of area, and #4, Describing and analyzing two-dimensional shapes.** (See Connections for explanation)

This unit address work from 1 cluster, Reason with shapes and their attributes. *(See Connections for explanation)

STANDARDS

CC_Common Core State Standards - Mathematics (2010) - Grade 3
Domain 3.G Geometry
Cluster Statement: Reason with shapes and their attributes.
Standard 3.G.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
Standard 3.G.2 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.

CONTENT ELABORATIONS

3.G.1	In Grade 2, students identify and draw triangles, quadrilaterals, pentagons and hexagons. Third graders build on this experience and further investigate quadrilaterals (technology may be used during this exploration) Students recognize shapes that are and not quadrilaterals by examining properties of the geometric figures. They conceptualize that a quadrilateral must be a closed figure with four straight sides and begin to notice characteristics of the angles and the relationship between opposite sides. Students should be encouraged to provide details and use proper vocabulary when describing the properties of quadrilaterals. They sort geometric figures and identify squares, rectangles and rhombuses and quadrilaterals. Students should classify shapes by attributes and draw shapes that fit specific categories. For examples, parallelograms include: squares, rectangles, rhombi, or other shapes that have two pairs of parallel sides. Also, the broad category quadrilaterals include all types of parallelograms, trapezoids, and other four-sided figures. **MP.2, MP.3, MP.5, MP.6** should be emphasized.
3.G.2	**3.G.2** builds on students' work with fractions and area. Students are responsible for partitioning shapes into haves, thirds, fourths, sixths and eights. Given a shape, students partition it into equal parts, recognizing that these parts all have the same area. they identify the fractional name of each part and are able to partition a shape into parts with equal areas in several different ways. **MP.2, MP.4, MP.5** should be emphasized.

UNIT VOCABULARY

angle	hexagon	parallelogram
vertex	octagon	parallel
right angle	triangle	square
ray	attribute	rectangle
endpoint	quadrilateral	rhombus
polygon	right triangle	trapezoid
pentagon		

BIG IDEAS

ENDURING UNDERSTANDINGS

• Identify and describe properties of two-dimensional shapes using properties that are shared between the shapes.
• Generalize that shapes fit into a particular classification.
• Compare and classify shapes by their sides and angles, and connect these with definitions of shapes.
• Geometric figures can be classified according to their properties.
• Quadrilaterals can be classified according to the lengths of their sides.
• Recognize shapes that are and are not quadrilaterals by examining the properties of the geometric figures.
• Conceptualize that a quadrilateral must be a closed figure with four straight sides and begin to notice characteristics of the angles and the relationship between opposite sides
• Provided details and use proper vocabulary when describing the properties of quadrilaterals.
• Sort geometric figures and identify squares, rectangles, and rhombuses as quadrilaterals.
• Classify shapes by attributes and by drawing shapes that fit specific categories. (e.g.; parallelograms include: squares, rectangles, rhombi, or other shapes that have two pairs of parallel sides.
• The broad category "Quadrilaterals" includes all types of parallelograms, trapezoids and other four-sided figures.
• Relate fraction work to geometry by expressing the area of a shape as a unit fraction of the whole.

ESSENTIALS QUESTIONS
Choose a few questions based on the needs of your students

• How can geometric shapes help me solve real-world problems?

CONNECTIONS

In Critical Focus Area #3, students recognize area as an attribute of two-dimensional regions. They measure the area of a shape by finding the total number of same-size units of area required to cover the shape without gaps or overlaps, a square with sides of unit length being the standard unit for measuring area. Students understand that rectangular arrays can be decomposed into identical rows or into identical columns. By decomposing rectangles into rectangular arrays of squares, students connect area to multiplication, and justify using multiplication to determine the area of a rectangle.

In Critical Focus Area #4, students describe, analyze, and compare properties of two-dimensional shapes. They compare and classify shapes by their sides and angles, and connect these with definitions of shapes. Students also relate their fraction work to geometry by expressing the area of part of a shape as a unit fraction of the whole.

* This cluster is connected to Reason with shapes and their attributes **(2.G.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
3.G.1	Understand that shapes in different categories may share attributes, and that the shared attributes can define a larger category.	Understand that shapes in different categories may share attributes, and that the shared attributes can define a larger category. 1. Identify and define rhombuses, rectangles, and squares as examples of quadrilaterals based on their attributes. 2. Describe, analyze, and compare properties of two-dimensional shapes. 3. Compare and classify shapes by attributes, sides and angles. 4. Group shapes with shared attributes to define a larger category (e.g., quadrilaterals) 5. Draw examples of quadrilaterals that do and do not belong to any of the subcategories.
3.G.2	Partition shapes into parts with equal areas.	Partition shapes into parts with equal areas. 1. Know that shapes can be partitioned into equal areas. 2. Describe the area of each part as a fractional part of the whole. 3. Describe the area of each part as a fractional part of the whole.

1. Common Core Model Curriculum
2. McGraw-Hill, **My Math** Chapter 14
3. Hands-on Standards Geometry Lessons # 1,2,3, & 13
4. Manipulatives: pattern blocks(squares, rectangles, triangles), tangrams
5. Deb Diller Math Work Stations materials & process
6. Georgia Math frameworks, Grade 3 Unit 4
7. Smart Board resources
8. United Streaming: Mathica's Workshop: Geometric Shapes
9. Rectangles & Parallelograms http://illuminations.nctm.org/LessonDetail.aspx?id=L350
10. SCS Math Resources: Math PLayground: Identify Shapes , Plane Shapes, Perimeter of Squares, Perimeter of Shapes, Area of Squares, Area of Shapes, Triangles, & Quadrilaterals
11. Possible Literature: Geometry for Every Kid: Easy Activities That Make Learning Geometry Fun by Janice VanCleave;
Sir Cumference and the Great Knight of Angleland: A Math Adventure
by Cindy Neuschwander; Counting on Frank by Rod Clement; Polygons by David L. Stienecker; Build It with Boxes by Joan Irvine.