

Curriculum Parent Overview (Grade 5)

MATHEMATICS

UNIT #8 PROPERTIES OF POLYGONS (2-D Geometry and Measurement)

CONTENT FOCUS: Students classify triangles and quadrilaterals by attributes and identify the properties of the figures that belong in each category. They examine how categories of polygons are related and how a figure can belong to more than one category. Students build sequences of related rectangles and compare how the perimeter and area changes. They use these rectangles as a context to analyze numerical relationships and to practice adding and multiplying mixed numbers and decimals.

UNIT FOCUS:

- Classifying two-dimensional figures: Dimensional figures can be sorted based on a tribute such as number of sides, length of sides, and size of angles. Students sort cards and draw additional figures that share certain attributes. They name and determine properties of categories of triangles and quadrilaterals. Determining how different types of shapes are related, students also see how their attributes are related. They come to understand that while there are specific attributes that define a category of shapes, that category of shapes also has the attributes of the categories of which it is a subcategory. Students begin to make sense of the hierarchical classification of geometric figures.
- Analyzing numerical patterns in the perimeters and areas of related rectangles: The distance around the outside of a two-dimensional shape is called the perimeter. The amount of space that a given object covers is called the area. Although both perimeter and area are related to the shape of a rectangle, changes to the shape of a rectangle affect these measures in different ways. Students use rectangles as a contact to analyze numerical relationships when the perimeter or area of a rectangle is increased in size in a regular way (2 times larger, 3 times larger, etc.) Students also examine situations in which two rectangles with the same perimeter have different areas and two rectangles with the same area have different perimeters.
 - For example, students study what happens if a rectangle is cut in half horizontally and then the two pieces are moved and reconnected to make a new rectangle. Students find the area of the original shape is maintained. No area is gained or lost; however, the perimeter has been changed.

This work highlights the key mathematical idea that perimeter and area are two different, independent types of measurement.

MATHEMATICAL PRACTICES:

MP2: Reason abstractly and quantitatively.

MP3: Construct viable arguments and critique the reasoning of others.

CONNECTIONS TO PREVIOUS CONTENT: The geometry work in this unit builds on previous work with classifying polygons and, more specifically, triangles and quadrilaterals in Grades 3 and 4. The measurement work builds on previous work in Grades 3 and 4 on understanding and finding perimeter and area and continues the work, from Grade 5 Unit 5, of comparing and analyzing patterns which show how perimeter and area change when dimensions are changed. The work in this unit assumes that students are familiar with names for types of triangles and quadrilaterals and have had some experience in sorting them by properties. It also assumes

students have a generalizable method for finding perimeter and area of rectangles and can add and multiply fractions and decimals.

CONNECTIONS TO FUTURE CONTENT: In future years, students refine their understanding of classification of geometric shapes as they develop a deeper sense of the critical attributes that define a shape. The students' study of perimeter and area from this unit provides the building blocks for understanding the formulas for calculating these measures for a variety of shapes.

MATH AT HOME:

- **Triangle and Quadrilateral Scavenger Hunt** Look for examples of triangles and quadrilaterals (closed shapes with 4 straight sides) with your child. For example, when you are in the car or on a walk, your child can point out the triangles or quadrilaterals that he or she sees on signs, buildings, shop windows, and so on.
- **Building Polygons** You and your child can use household materials to create 2-dimensional polygons—closed shapes with straight sides that come together at vertices. You can use toothpicks or straws for the sides of your polygons, and small marshmallows, clay, or jellybeans as fasteners for the vertices. How many different kinds of quadrilaterals can you build? How many different kinds of triangles? What different-sized angles can you make?
- **Playing “I Spy” Polygons and Angles** To help your child investigate the properties of polygons (especially triangles and quadrilaterals) and patterns involving their sides and angles, find figures around the house that fit a rule and play a guessing game. For example, you might describe a mirror by saying, “I’m thinking of something in this room that has two equal sides, at least two equal angles, and at least two parallel sides. What could it be?” Then have your child identify objects that fit that rule, while trying to guess which specific object you were describing.
- Look for Review the Math Words and Ideas videos for this unit on Savvas Site