Grade 4 Math

Unit 4: Reasoning With Shapes

Dear Families,

We want to make sure that you understand the mathematics your child will be learning this year. Below you will find the standards we will be learning in Unit 4.

Each standard is in bold print, and below each one is an explanation with examples. Please let your teacher know if you have any questions. We appreciate your partnership and support.

4.GSR.8.1: Explore, investigate, and draw points, lines, line segments, rays, angles (right, acute, obtuse), perpendicular lines, parallel lines, and lines of symmetry. Identify these in two-dimensional figures.

Students should be able to…

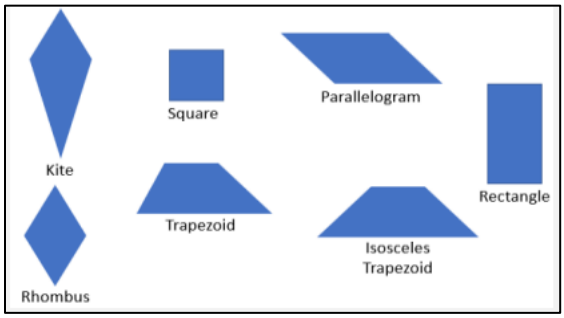
- explore these concepts using visual tools.
- investigate lines of symmetry in two-dimensional figures as a property.
- investigate specific properties such as perpendicular line segments, lines of symmetry, etc. as they work with two-dimensional figures.
- draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular lines.

Helpful Vocabulary:

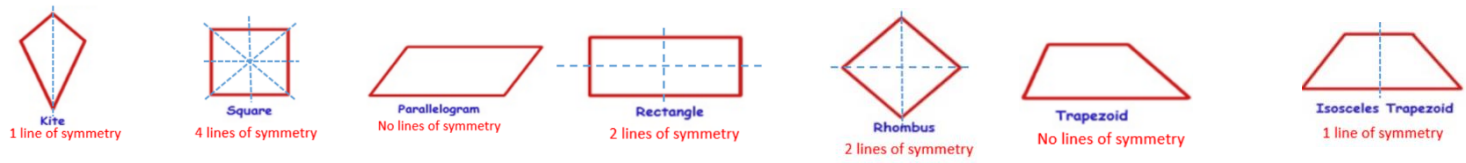
- right angle – an angle measuring exactly 90°
- acute angle – an angle larger than 0° and smaller than 90°
- obtuse angle – an angle larger than 90° and smaller than 180°
- perpendicular lines – two lines that meet to form an intersection at a right angle

Example:

How many lines of symmetry do each of the quadrilaterals below have?



Answers:



4.GSR.8.2: Classify, compare, and contrast polygons based on lines of symmetry, the presence or absence of parallel or perpendicular line segments, or the presence or absence of angles of a specified size and based on side length.

Students should be able to…

- classify shapes based on specific properties such as perpendicular line segments, lines of symmetry, congruent angles or sides, or a lack of these attributes.
- indicate right angles with a square symbol.
- investigate lines of symmetry in two dimensional figures as a property.

Notes: The focus should *not* be on having students memorize terminology. This objective does *not* require students to create a hierarchy.

Helpful Vocabulary:

- polygon - a closed figure with at least three straight sides and angles
    - regular polygon - regular only when all sides are equal and all angles are equal
    - irregular polygon - all sides are not equal or all angles are not equal
- isosceles triangle – a triangle containing at least two equal length sides and two equal interior angle measures; subclass includes equilateral triangles
- equilateral triangle – a triangle with three equal-length sides and three 60° interior angles
- scalene triangle – a triangle containing three unequal side lengths and three unequal angle measures
- right triangle – a triangle with one right angle
- acute triangle – a triangle containing three acute angles
- obtuse triangle – a triangle containing one obtuse angle
- trapezoids – contain at least one pair of parallel sides

Example (Activity):

Do this activity with your student to classify two-dimensional figures.

1. Use the grid of dots below or make a dot grid on another sheet of paper.
2. One person draws a shape. The shape could be a triangle, quadrilateral, or another kind of shape with straight sides.
3. The other person describes the shape. Be sure to talk about any parallel sides and perpendicular sides that the shape has. Describe the angles of the shape, too! Then name the shape.
4. Switch roles. Take turns drawing a shape and describing and naming it.



4.GSR.8.3: Solve problems involving area and perimeter of composite rectangles involving whole numbers with known side lengths.

Students should be able to…

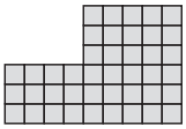
- find the area of composite rectangles.
- find the perimeter of composite rectangles.
- find the area and/or perimeter of composite rectangles given the side lengths (the rectangle may or may not include a grid with 1-inch squares).

Note: Students are *not* expected to find unknown side lengths when exploring composite rectangles.

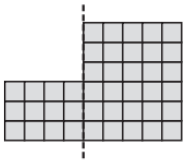
Example:

You can break apart a figure made of combined rectangles into smaller rectangles to find the area of the figure.

Each unit square is 1 square inch.
What is the area of the figure?



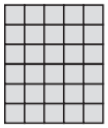
Draw a line to break the figure into two rectangles.



Multiply to find the area of each rectangle.



$3 \times 4 = 12$



$6 \times 5 = 30$

To find the total area of the figure, add the areas of the two rectangles. $12 + 30 = 42$

The area is 42 square inches.