

LESSON 9

Objective

Explore attributes of plane shapes.

Common Core State Standards

- **K.G.2** Correctly name shapes regardless of their orientations or overall size.
- **K.G.4** Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).

Geometry

Attributes of Plane Shapes

Each plane shape has attributes that make it unique and recognizable. A *square* has four equal sides and four right angles. A *rectangle* also has four sides. However, a rectangle has two opposite sides that are long and two opposite sides that are short. A *triangle* has three sides and three corners. A *circle* is a plane shape that has no sides or corners. Size and color are also attributes. Learning the basic attributes of plane shapes introduces children to shape and attribute vocabulary and prepares children for more advanced skills in geometry and algebra, such as sorting and classifying.

Try It! Perform the Try It! activity on the next page.

Talk About It

Discuss the Try It! activity.

- Hold up a square. **Ask:** *What shape is this? How many sides does it have? How many corners does it have?*
- Hold up a rectangle. **Ask:** *What shape is this? How many sides does it have? How many corners? Is it the same as the first shape, or is it different?*
- Hold up a triangle. **Ask:** *What shape is this? How many sides does it have? How many corners?*
- Hold up a circle. **Ask:** *What shape is this? How many sides does it have? How many corners?*

Solve It

With children, reread the problem. Have children draw the shapes that Nicky and Louisa drew on a piece of paper. Have them write the number of sides each shape has next to the shape. Ask children what shapes they have drawn. Discuss with children how they can tell that the shapes are different.

More Ideas

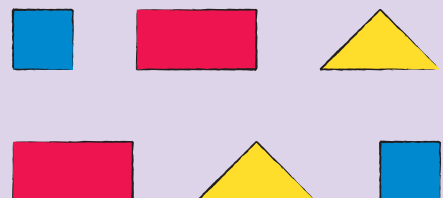
For other ways to teach about the attributes of plane shapes—

- Have children sort Pattern Blocks by color, number of sides, or number of corners. Ask them to identify the shapes they know.
- Have children work in pairs with Attribute Blocks to describe how two shapes are alike and how they are different. For example, give a pair of children a red square and a yellow rectangle and have them tell two ways the shapes are the same and two ways the shapes are different.

Formative Assessment

Have children try the following problem.

Draw a line from one shape to the shape that matches it.



Try It!

40 minutes | Groups of 3

Here is a problem demonstrating attributes of plane shapes.

Nicky and Louisa are drawing shapes on the board. Nicky draws a shape that has four sides. All the sides are the same length. Louisa draws a shape that has three sides. What shapes did Nicky and Louisa draw? Are the shapes the same or different? How can you tell?

Introduce the problem. Then have children do the activity to solve the problem.

Distribute bags filled with several matching pairs of Attribute Blocks to each group.

Materials

- Attribute Blocks (several squares, rectangles, triangles, and circles per group)
- paper grocery bags or pillow cases (1 per group)



1. Have children close their eyes, reach into the bag, and pull out a block. Children should say the name of the shape they chose and note how many sides and corners it has.



2. Next, children should reach into the bag and try to find a shape that matches the first block they chose. Have children count to make sure that the two blocks have the same number of sides and corners. **Ask:** *Are the two shapes the same?*



3. Finally, have children put their shapes back in the bag and pick out two new blocks that are different from each other. They should count the number of sides and corners and name the shapes.

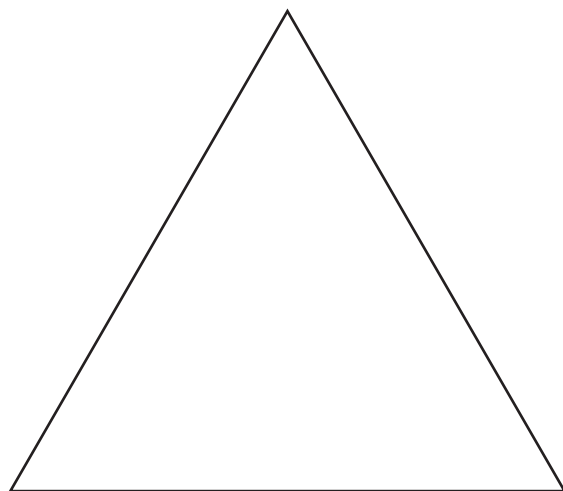
Look Out!

Some children may confuse the shapes, especially the rectangle and the square. If this happens, show a square and talk about how all sides are the same. Then lay the square on top of a rectangle and point out that the rectangle has two long sides and two short sides.



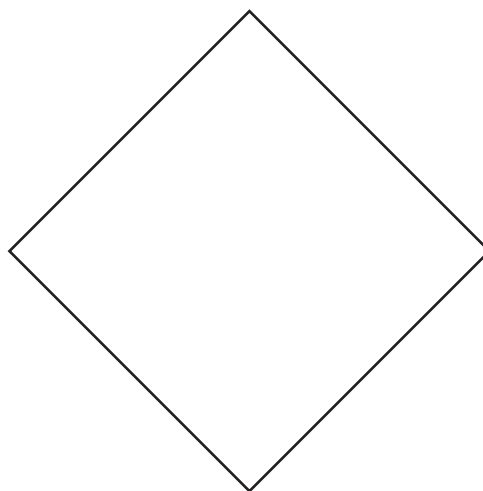
Check children's work.

1.



3

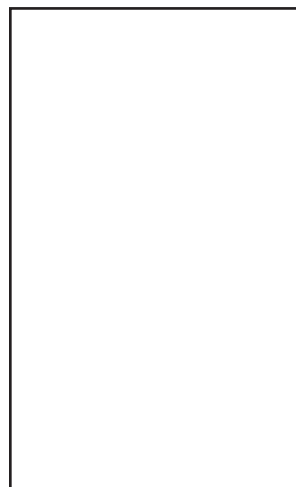
sides



4

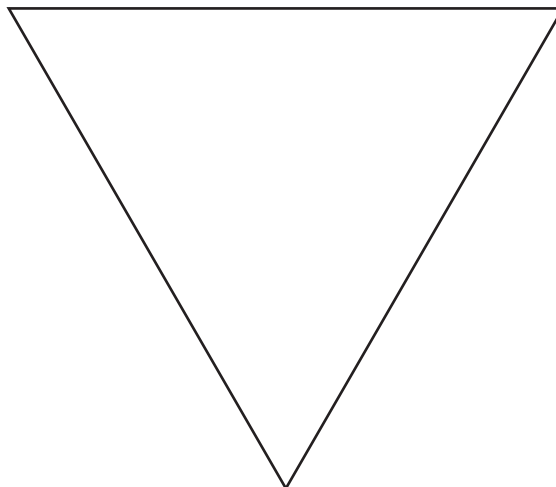
corners

2.



4

sides



3

corners

Directions

1. Color the triangle blue. How many sides does a triangle have? How many corners does a square have?
2. Color the rectangle yellow. How many sides does a rectangle have? How many corners does a triangle have?



Answer Key

Check children's work.

Challenge

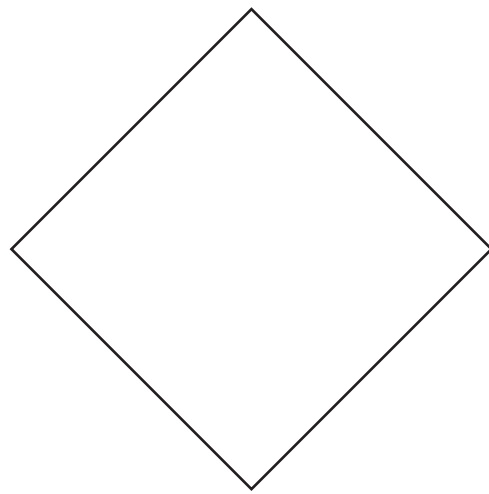
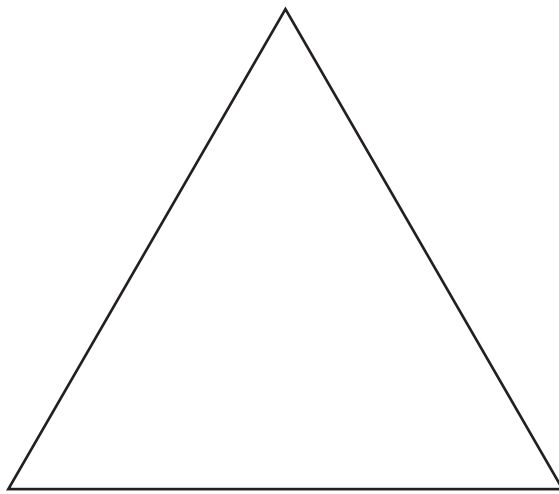
Draw a square. Then draw a rectangle. How many sides does each shape have? How many corners? Color the square green. Color the rectangle red. Tell how the shapes are the same and how they are different.

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Name _____

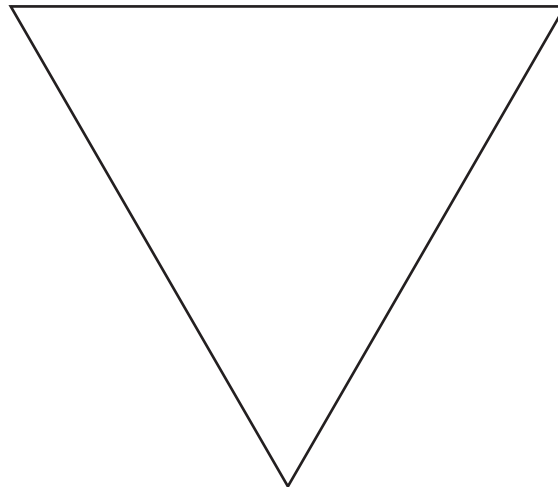
1.



_____ sides

_____ corners

2.



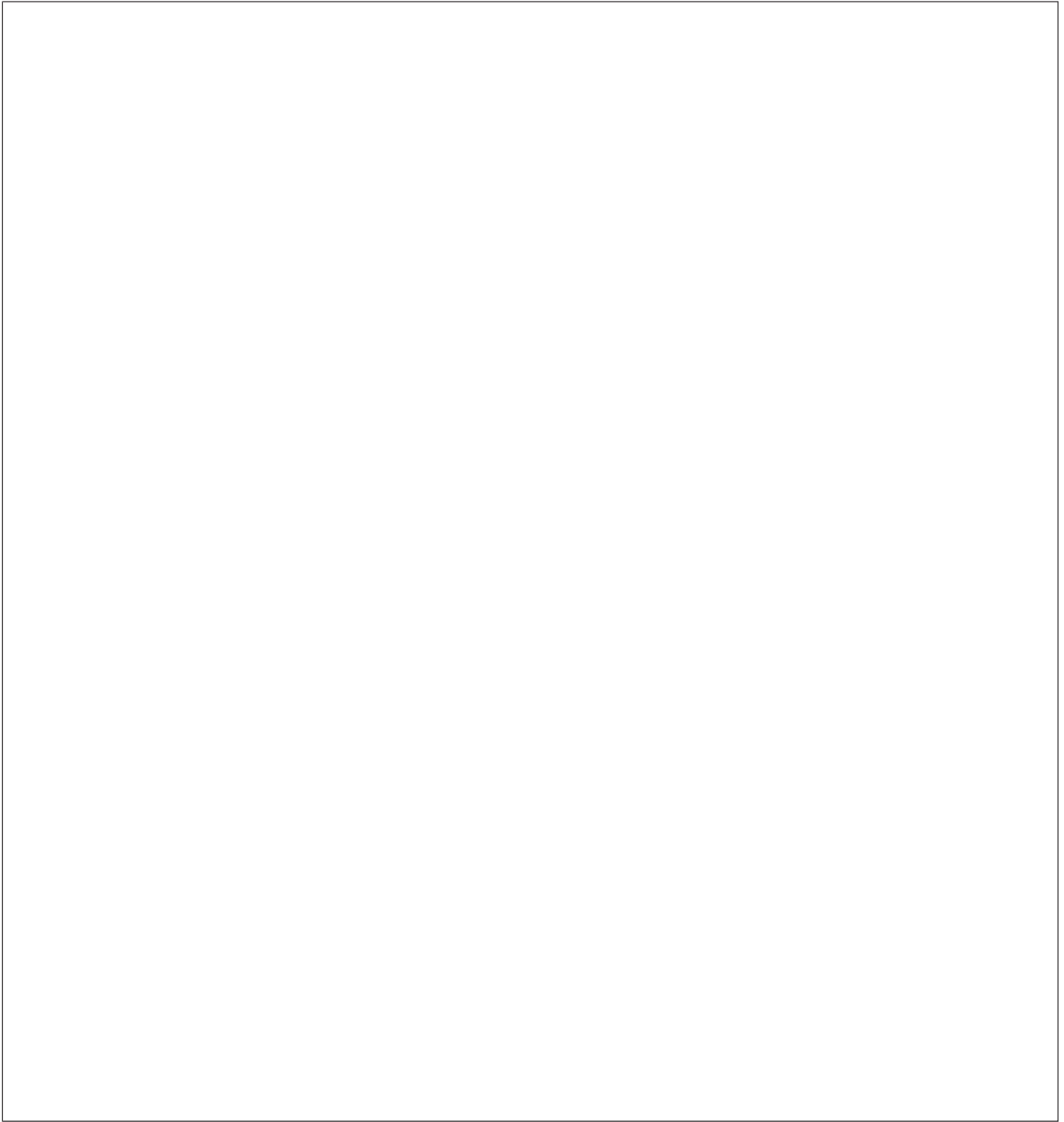
_____ sides

_____ corners

Directions

1. Color the triangle blue. How many sides does a triangle have? How many corners does a square have?
2. Color the rectangle yellow. How many sides does a rectangle have? How many corners does a triangle have?

Name _____



Challenge

Draw a square. Then draw a rectangle. How many sides does each shape have? How many corners? Color the square green. Color the rectangle red. Tell how the shapes are the same and how they are different.

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