

# Tools for Instruction

## Classify Plane Figures

**Objective** Use properties to classify plane figures into categories and subcategories.

Students can sort shapes by a variety of attributes. They are beginning to see that some shapes can be accurately called by two or more names, or fit into more than one subcategory. Having a deep understanding of geometric properties and comfort with geometric terminology is an important foundation for students' future work in geometry, such as reflections, rotations, and translations, as well as geometric patterns.

### Four Ways to Teach

#### Classify Pairs of Shapes 10–15 minutes

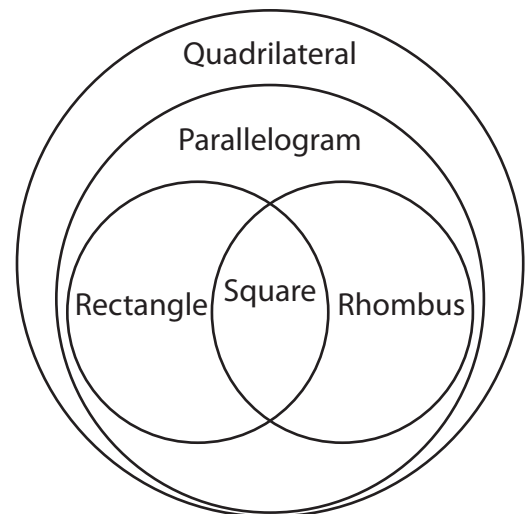
Have the student draw two shapes that are part of the same category. The student should name the category, and then name a subcategory in which only one of the shapes could belong and a subcategory that describes the other shape. For example, if the category is “triangles,” then the subcategories could be “equilateral triangle” and “obtuse triangle.”

#### Brainstorm Categories for Quadrilaterals 10–15 minutes

Make a list of quadrilaterals. Have the student brainstorm ideas for several subcategories of quadrilaterals. Within each subcategory, write the names of quadrilaterals that belong. Help the student understand how the number of quadrilaterals in each subcategory gets smaller as the attributes get more specific.

#### Name All Categories 20–30 minutes

Draw a square. As a group, have students brainstorm all of the categories into which it could be sorted. Help students categorize a square as a quadrilateral, a parallelogram, a rectangle, and a rhombus. Include all of the names that describe it. Then show students how to create a Venn diagram showing the relationships among the subcategories, and where a square falls.



**Categorize in Pairs**

10–15 minutes

Put students in pairs to categorize a shape. Have one student draw a shape and name a general category for it. The other student draws a shape that meets the general category and then names a more specific subcategory for it. Students alternate drawing and naming subcategories until only the size and orientation of the shape can vary.

**Check for Understanding**

Ask the student to draw a triangle, and then provide three subcategories of shapes into which it could be classified. (Sample: *acute, scalene, obtuse*)

For the student who struggles, use the chart below to help pinpoint where extra help may be needed.

If you observe...	the student may...	Then try...
the student struggles to place the shape into multiple subcategories	not understand that shapes in one subcategory also fit into all of the categories above it.	helping the student list all the subcategories from closed shape to the shape drawn.
the student names subcategories into which the shape does not fit	not understand the relationship between categories and the shapes in them.	providing practice problems in which the student draws shapes with given attributes.
the student is unable to name categories of triangles	not understand what attributes determine categories and subcategories of shapes.	prompting the student to think about the lengths of the sides and types of angles. Draw a few triangles and ask the student to describe them according to lengths of the sides and types of angles.