

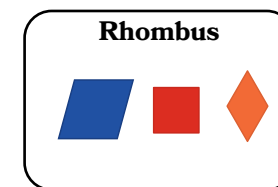
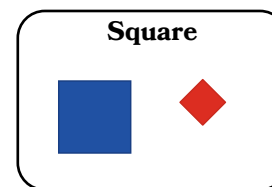
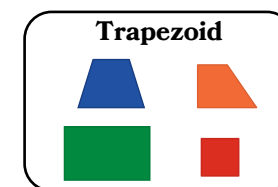
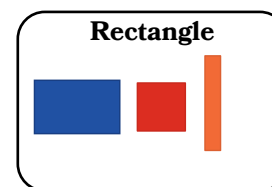
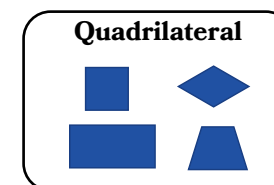
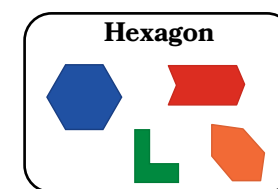
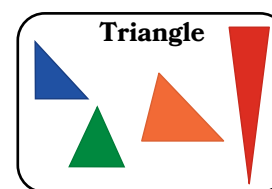
Why

Part 1: Attributes of Shapes

How do attributes of shapes help students name and describe them?

Grade 1 students expand their knowledge of defining attributes, or the mathematical characteristics of a shape, to describe flat shapes with increasing precision. They use attributes, such as the number of straight sides and whether the shape has equal-length sides, parallel sides, or square corners, to sort a variety of shapes into different categories. They find that the fewer attributes a shape category has, the more shapes that fit into that category. In contrast, the more attributes a category has, the fewer shapes that fit into that category. Students see that the same shape can have more than one name or fit into more than one category, depending on the attributes they are considering. This concept connects to students' experience of naming and representing numbers in various ways.

- **Triangle**—A triangle is any closed shape with 3 straight sides. In later grades, students use attributes, such as angles, to name specific triangles. Grade 1 students see a variety of triangles and may notice specific attributes, but the name *triangle* stays consistent.
- **Hexagon**—A hexagon is any closed shape with 6 straight sides. Students identify a variety of hexagons in grade 1, not just regular hexagons with 6 equal side lengths and 3 pairs of parallel sides.
- **Quadrilateral**—A quadrilateral is any closed shape with 4 straight sides. The following shapes can be called quadrilaterals: rectangle, square, trapezoid, and rhombus. Grade 1 students do not work with parallelograms or kites.
- **Trapezoid**—A trapezoid is any closed shape with 4 straight sides and at least 2 parallel sides. A square and a rectangle may be called a trapezoid.
- **Rectangle**—A rectangle is any closed shape with 4 straight sides and 4 right angles. A square can also be called a rectangle.
- **Rhombus**—A rhombus is any closed shape with 4 straight sides of equal length. A square can also be called a rhombus.
- **Square**—A square has 4 right angles and 4 straight sides of equal length. No other shapes can be called a square.



Students describe and name both exemplar and variant shapes. Exemplars are the shapes students typically visualize. They are often symmetrical with a horizontal base. Variants are less frequently encountered in children’s books and media. To name these shapes, students must pay close attention to their defining attributes. When asked to sort shapes or to identify a specific shape within a set, students are shown some nonexamples, or distractors. Obvious distractors do not look much like the exemplars and are easier for students to categorize as nonexamples on sight. Difficult distractors look more like the exemplars, but they do not have all the defining attributes of the target shape. They require students to attend to defining attributes with more precision.

