InsightMath

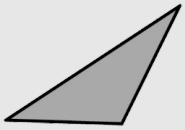
Composing and Decomposing Shapes

Family Guide | Grade 1 | Unit 10

Your student is exploring how names and defining attributes of shapes are determined by how their component parts are put together.

Key Math Ideas

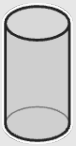
In Kindergarten, students had some experience with 2-D and 3-D shapes, such as in activities to sort and compare shapes. In this unit, students add to their understanding of geometry by identifying and naming polygons and nonpolygons. They explore the attributes of 2-D shapes, such as number of sides and whether the shape has a right angle using the corner of a notecard, and explore the attributes of 3-D shapes, such as faces, edges, and vertices. This unit encourages students to use attributes to justify their identification of shapes rather than allowing students to rely solely on visual recognition.



Triangle: a 2-D shape with 3 vertices and 3 sides

Quadrilateral: a 2-D shape with 4 vertices and 4 sides

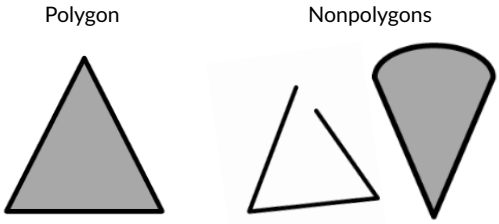
Rectangular prism: a 3-D shape with 6 faces that are all rectangles



Cylinder: a 3-D shape with two faces that are circles

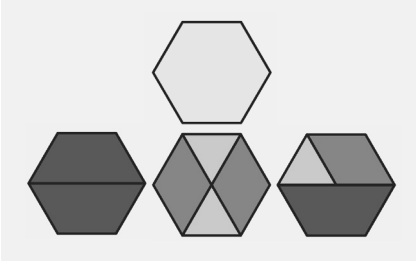
→ In the first half of the unit, your student will learn to

- identify polygons (two-dimensional shapes with straight lines) and nonpolygons (open shapes or round, closed shapes);
- name and draw 2-D shapes based on defining attributes. For example, saying they know a shape is pentagon because it is a polygon with five sides;
- identify squares and rectangles as special types of quadrilaterals with four right angles;
- identify defining attributes of 3-D shapes, such how a rectangular prism a 3-D shape with 6 faces that are all rectangles.



→ In the second half of the unit, your student will learn to

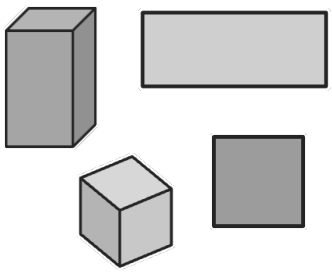
- compose 2-D shapes using combinations of polygons;
- describe relationships between different polygons, such as saying, “The hexagon is made up of two trapezoids or made up of two rhombuses and two triangles”;
- identify the 3-D shapes used in composite 3-D shapes.



Helpful Hint

Your student is learning that 2-D shapes are defined by the number of sides and that 3-D shapes are defined by the shape of each face.

When your student is identifying shapes in the real world or in their math assignments, ask them to explain how they know the name of the shape based on the number of sides or on the faces and how they are put together.



Tips for Supporting Your Student at Home

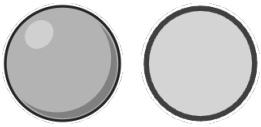
Questions to Ask Your Student

→ At the beginning of the unit:

- Is this shape a polygon? How do you know?
- How do you know the name of this shape based on its attributes? (*Hint: Try this with 2-D and 3-D shapes.*)
- How can you draw a _____ (a 2-D shape)?

→ By the end of the unit:

- What shapes are put together to create this shape? How do you know?
- What can you make by putting different shapes together?
- How can you make the same shape using different smaller shapes?

If...	Try...
your student incorrectly identifies a 3-D shape based on a single face or its 2-D outline, such as calling a sphere a circle . . . 	showing your student examples of 2-D and 3-D figures in the real world and having a conversation with your student about the differences between the 2-D and the 3-D shapes.

Student Strengths Spotlight

We take time to think. When drawing, composing, or identifying shapes, students take their time to make sure they are using the correct attributes.

We learn from our mistakes. Students learn from their errors when they misidentify shapes or use incorrect attributes to identify shapes.

Try This Together!

- **How Many Can You Draw?** Challenge your student to draw as many different-looking shapes as they can with 3 vertices and 3 sides, or with 4 vertices and 4 sides. Ask, "What is the name of this shape? How do you know?" and "Why are all of these shapes triangles if they all look different?" or "Why are all of these shapes quadrilaterals if they all look different?"
- **Go on a Shape Hunt!** While on a walk or a drive, look for shapes in the real world and ask your student to name them and to tell how they know based on the attributes. For example, point out a sign that is a rectangle or a brick that is a rectangular prism. You can also ask your student to compare the similarities and differences between shapes.
- **Draw a Picture!** Challenge your student to draw a picture using 4 circles, 1 triangle, and 3 rectangles or squares. Make your own drawing with the same shapes. Describe to each other how you made your drawing.
- **Composite Shapes in Your House or Neighborhood.** With your student, find items or structures that are made out of different shapes. Ask your student what 2-D and 3-D shapes make up the items or structure. For example, a shed might be composed of a rectangular prism and a pyramid, while a star might be composed of 5 triangles and a pentagon.