

## Core Content

**Cluster Title:** Analyze, compare, create, and compose shapes.

**Standard 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).

### **MASTERY Patterns of Reasoning:**

#### **Conceptual:**

- Students will understand that shapes are defined by the number of sides and vertices/corners.
- Students will understand that squares have sides of equal length.
- Students will understand that common attributes are used to compare shapes.
- Students will understand that orientation does not change the name of the shape.

#### **Procedural:**

- Students can count and tell the number of sides/vertices of each shape.
- Students can describe the similarities and differences between shapes (2-D to 2-D, 3-D to 3-D, and 2-D to 3-D).
- Students can list the attributes of a single shape.
- Students can recognize the same shape in different orientations.
- Students can analyze and compare two- and three-dimensional shapes.
- Students can use informal language to describe shapes' similarities, differences, parts and other attributes.

#### **Representational:**

- Given two shapes, students can describe how they are the same and different (2-D to 2-D, 3-D to 3-D, and 2-D to 3-D).
- Students can recognize the similarities and differences of shape, regardless of size and/or orientation.

## Supports for Teachers

<b>Critical Background Knowledge</b>
<p><b>Conceptual:</b></p> <ul style="list-style-type: none"><li>Students will begin to recognize basic shapes in drawings and objects.</li><li>Students will understand that objects are described by shape.</li><li>Students will understand that objects can be grouped by similarities.</li></ul> <p><b>Procedural:</b></p> <ul style="list-style-type: none"><li>Students can identify basic shapes.</li><li>Students can count lines.</li><li>Students can identify shapes of objects and shapes in pictures.</li><li>Students can sort objects according to given attributes.</li></ul> <p><b>Representational:</b></p> <ul style="list-style-type: none"><li>Students can sort objects according to given attributes.</li></ul>
<b>Academic Vocabulary and Notation</b>
compare, similarities, differences, size, orientation, attribute, part, side, point/corner/vertex, straight, round, curved, shape, square, circle, triangle, rectangle, hexagon, cube, cone, cylinder, sphere

Instructional Strategies Used	Resources Used
<p>Teacher should present two shapes to be compared and discussed. Students should describe both the similarities and the differences of the two shapes. The discussion should focus on size, orientation, parts, and other attributes that define shapes (not arbitrary attributes such as color, texture, etc.).</p> <p>When analyzing and comparing shapes, use:</p> <ul style="list-style-type: none"> <li>• 2-D and 2-D Examples:               <ul style="list-style-type: none"> <li>○ Shapes with different number of sides/vertices (e.g., squares and triangles)</li> <li>○ Shapes with same number of sides but other attribute(s) different (e.g., square and rectangles)</li> <li>○ Same shapes, but with different sizes and orientations (e.g., triangles of different sizes, orientations, and angles)                   <ul style="list-style-type: none"> <li>▪ All examples of triangles should not be equilateral. Teachers should use other kinds of triangles as well (e.g., right triangles, scalene triangles, obtuse triangles). Students need not identify the type of triangle, but do need to know that any shape with 3 sides is a triangle.</li> </ul> </li> </ul> </li> <li>• 3-D and 3-D Examples:               <ul style="list-style-type: none"> <li>○ Shapes with apparent differences, such as straight/curved sides (e.g., cubes and spheres)</li> <li>○ Shapes with similar bases/faces (e.g., cones and cylinders)</li> <li>○ Shapes in different sizes and orientations (e.g., cylinder standing on base and cylinder lying on side)</li> </ul> </li> <li>• 2-D and 3-D Examples:               <ul style="list-style-type: none"> <li>○ Shapes with apparent similarities (e.g., squares and cubes, circles and spheres)</li> <li>○ Shapes with apparent differences (e.g., triangles and spheres)</li> </ul> </li> </ul>	<p>Burns, Marilyn. <i>The Greedy Triangle (Scholastic Bookshelf)</i>. Scholastic Paperbacks, 2008.</p> <p>Murphy, Stuart J. <i>Captain Invincible and the Space Shapes (MathStart 2)</i>. HarperCollins, 2001.</p> <p>shape manipulatives</p> <p>solid shapes</p> <p>flat shapes made of paper</p> <p><b>NOTE:</b> It is important to begin to expose students to shapes in different orientations and sizes. Do not limit student experience to regular polygons (i.e., all sides and angles of equal measure).</p>

<b>Assessment Tasks Used</b>	
<p><b>Skill-Based Task:</b> When presented with a variety of shapes, students can find common/different attributes, including dimensions.</p> <p>When given two shapes, students can identify the similarities and differences of the two shapes.</p> <p>Students can count the number of corners, sides, etc., on a shape.</p>	<p><b>Problem Task:</b> Given a piece of paper with different shapes drawn on it, students can circle or color all examples of the same shape, regardless of size or orientation.</p> <p>When given a list of attributes describing a shape, students can point to the correct shape.</p>