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Background Information

Geometry for young children begins with observing, classifying, describing, and naming shapes. Primary students begin by using their own vocabulary to describe objects, often telling how they are alike or different. Teachers should help their students to gradually incorporate conventional terminology into their descriptions of these shapes.

This activity is designed to let children explore shape through literature, body movements, and manipulatives, while providing an opportunity to develop the conventional terminology needed to describe the attributes (number of sides, number of vertices, intersecting lines, parallel lines) of two-dimensional objects.

Management

1. This activity will take several days to complete.
2. Divide students into groups of four when using the jump ropes.
3. Chinese jump ropes can be purchased at local department stores. If you are unable to get Chinese jump ropes, a six-foot length of elastic will work. Join the ends of the elastic to form a loop.
4. When forming the shapes, it is important for the students to be on the outside of the jump rope. As they pull the jump rope to form the shape, it is easier for them to see the corners if they are not inside the shape.

Procedure

Part One

1. Read *The Greedy Triangle*. Discuss shape words as they appear in the story, focusing on the number of sides and corners for each shape.
2. After reading *The Greedy Triangle*, ask the students to recall some of the shapes from the story. Record their responses on chart paper. Look at each shape word individually and ask the students to tell you everything they remember about that shape, including real-world examples of the shape. (e.g., triangle: three sides, three corners (vertices), pizza is cut into triangles.) Record their responses on a class chart. When looking at the square and rectangle, emphasize that the corners (vertices) are square corners; they are right angles. Show the students the square-edge of a piece of paper. Tell the students that not all shapes have square corners (right angles). Show them how they can use the square corner of a piece of paper as a right angle checker.
3. Discuss ways that the shapes are alike and different.
Part Two

1. Gather your class into an open area and have them form a circle by holding hands. Draw attention to the fact that they have just formed a geometric shape that has no straight sides and no corners (vertices).

2. Ask your students to recall the story of *The Greedy Triangle*. Question them about the number of corners (vertices) and sides (edges) that a triangle has. Ask the students how they might make a triangle using their bodies. Allow them to demonstrate the triangles. (Some students will hold their arms above their head and join their hands together to form a point, while others may put their pointer fingers and thumbs together to form a three-sided, three-cornered shape.) Discuss how their triangles are alike and different. [Triangles always have three corners (vertices) and three sides (edges). Sometimes they have different sized corners (vertices) and side (edge) lengths.]

3. Ask the students to describe a triangle. Invite three students to come to the center of the circle. Give them one Chinese jump rope and ask them to make a triangle. Invite the students to make their triangle larger. …smaller.

4. Discuss whether changing the size affected the fact that it was a triangle. [not at all] Ask the students what every triangle must have. [three sides (edges), three corners (vertices)]

5. Divide the class into groups of four and give each group a jump rope.

6. Instruct each group of students to form a triangle. Ask the class what shape they think they would get if they, like the shapeshifter, added one side (edge) and one corner (vertex) to their triangle. [There are several answers that would be correct: a square, a rectangle, a parallelogram, a rhombus, or a trapezoid. They could even make a general quadrilateral (one that has no special attributes other than four sides (edges) and four corners (vertices)).]

7. Discuss the many possible answers.

8. Invite the students to add one side (edge) and one corner (vertex) to their triangle. Instruct them to look at the shapes formed by the other groups. Have the students describe what they observe. [four sides (edges), four corners (vertices)] Ask all groups to make their shapes into squares if they made four-sided shapes other than squares. Have them now describe what they observe. [four square corners (vertices), four sides (edges) of equal length, opposite sides (edges) are parallel, lines intersect at the corners (vertices)]

9. Have them continue constructing shapes by adding one corner (vertex) and one side (edge) each time until they have constructed an octagon. Each time, ask them what they think the new shape will be before they physically add the side (edge) and corner (vertex). Then, have each group make the shapes with the jump rope. After constructing each shape, discuss the number of sides (edges), number of corners (vertices), and the name given to that particular shape.

Connecting Learning

1. Do you think it was easier to make shapes with fewer sides (edges) or more sides (edges)? Why?

2. What were some of the shapes that you were able to make?

3. How were the four-sided shapes the same? …different?

4. What did you discover about triangles? [Triangles can have the same name and yet different sized corners (vertices) and side (edge) lengths.]

5. What did you discover about shapes by constructing them?

Curriculum Correlation


Unhappy with its shape, a triangle keeps asking the local shapeshifter to add more lines and angles to change its shape thereby introducing various polygons to the reader.

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Key Question
How can we use a Chinese jump rope to model different shapes?

Learning Goals

*Students will:*

- construct two-dimensional geometric shapes using Chinese jump ropes, and
- compare and contrast two-dimensional geometric shapes.
1. Do you think it was easier to make shapes with fewer sides (edges) or more sides (edges)? Why?

2. What were some of the shapes that you were able to make?

3. How were the four-sided shapes the same? ...different?

4. What did you discover about triangles?

5. What did you discover about shapes by constructing them?