

Polygons Galore!

Reporting Category Geometry

Topic Investigating polygons

Primary SOL 4.12 The student will
a) define *polygon*; and
b) identify polygons with 10 or fewer sides.

Materials

- A relevant story about shapes, such as *The Greedy Triangle* by Marilyn Burns
- Drinking straws
- Pattern blocks

Vocabulary

plane figure, two-dimensional, properties, square, circle, triangle, rectangle, rhombus, parallelogram, quadrilateral, polygon

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Introduce a “shape story,” such as *The Greedy Triangle*, to the students by telling a little about the plot. Explain that the triangle in the story has a purpose but is not happy being just a triangle. Ask students what purpose(s) a triangle could have, and elicit suggestions of places or situations in which triangles may serve a purpose. Point out that the triangle shape is often used in construction because it is completely rigid; hence, any kind of structure (e.g., building, furniture, vehicles) using triangles can be very strong.
2. Define, *polygon* as a closed plane figure composed of line segments that do not cross. After explaining and discussing this definition and citing examples of polygons, tell students that they are going to listen for examples of polygons in the story that you are going to read twice.
3. During the first read-through, instruct students to pay close attention to the choices the triangle makes in order to identify each shape as it is mentioned and list the properties as well as the purpose of that shape. You might also ask students to predict what shape they think will come next as they begin to realize the pattern in the story. Have a student list the name of each shape on the board as you read. You might also have students list in their math journals (or in a special “Polygon Booklet” that they could make) the shape names as they are written on the board.
4. Before the second read-through, give each student 10 drinking straws, and have each student use three straws to create a triangle. Instruct students to add to their triangles as you read the story, creating each shape as you read about it by adding a straw to their current shape. Have them also write the applicable number of sides beside each shape name written in their journals.
5. Have students complete their journal entries or booklets when the story is complete by listing other properties of each shape.

Assessment

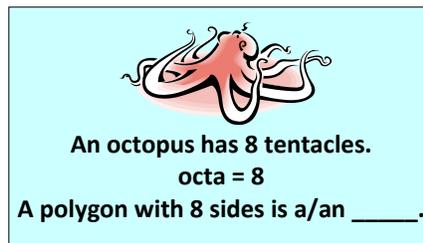
- **Questions**
 - Why did the shape at the end of the story roll down the hill? (The sides were so small that they could not keep the shape from rolling down the hill.)
 - How many sides can a shape have?
- **Journal/Writing Prompts**
 - List many uses for a triangle, some from the story and others that you identify.
 - Write a story about an unhappy octagon or other polygon with too *many* sides.

Extensions and Connections (for all students)

- Have students create study cards for each polygon mentioned in the story, drawing the shape on one side and writing a description of it or clues about it on the other side.
- Have students at the class pattern blocks and name the shape of each block's surface according to its properties.
- Have students create study cards for the “-gon” family. These cards will give clues to help students remember each member of the family, as shown in the example below:



front side



back side

Strategies for Differentiation

- Allow students to type or dictate to a scribe instead of writing in a journal.
- Have students participate in a “Think, Pair, Share” with a partner for steps 3 and 4.
- Allow students to access polygons (e.g., pattern blocks, pictures, cutouts) instead of drawing them.