

Polygons Galore!

Strand:	Measurement and Geometry
Topic:	Investigating polygons
Primary SOL:	3.12 The students will a) define polygon; and b) identify and name polygons with 10 or fewer sides)
Related SOL:	3.12c

Materials

- The book *The Greedy Triangle* (or any relevant story about shapes)
 - Burns, M. (1994) *The Greedy Triangle*. New York, NY: Scholastic Inc.
- Drinking straws
- Pattern blocks
- Polygon Exit Ticket (attached)

Vocabulary

circle, decagon, heptagon, hexagon, nonagon, octagon, parallelogram, pentagon, plane figure, polygon, properties, quadrilateral, rectangle, rhombus, square, triangle, two-dimensional

Student/Teacher Actions: What should students be doing? What should teachers be doing?

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 just being 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 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 and 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 mathematics 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 a straw to their

triangles as new shapes are introduced in the story. In their journals, have students write the number of sides that corresponds to each shape.

5. After the students complete their journal activity, come together as a class and review each polygon discussed and its properties. Have the students take the Polygon Exit Ticket to check for understanding.

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?
 - How did the shapes change as you continued through the story?
- **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 choose pattern blocks and name the shape of each block's surface according to its properties.
- Play a game with students where the goal is for the students to "claim" as many polygons as possible. In order to play game, the teacher must create all polygons on the floor using tape. The teacher will then say, "One, two, three, claim!" At this point, a student must choose a polygon to stand in. In order for the student to "claim" this polygon, he or she must correctly name the polygon and its properties. The teacher may keep a checklist of what student has claimed what polygon. This game can be played multiple times.

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.

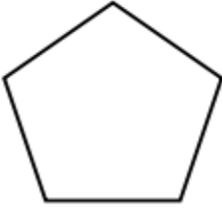
Note: The following pages are intended for classroom use for students as a visual aid to learning.

Polygons Exit Ticket

Name: _____

Date: _____

Underneath each picture, identify the polygon and name one property.



Name: _____

Property: _____



Name: _____

Property: _____



Name: _____

Property: _____