

Exploring Polygons with The Greedy Triangle

by Christina Myren, Conejo Valley USD, cmyren@aol.com; and
Jane Traut, Conejo Valley USD, jtraut@verizon.net



CONCEPT	Geometry
SKILLS	Making shapes from other shapes, defining shapes, sorting and classifying
MATERIALS	Elastic loops or Chinese jump ropes, geoboards, rubber bands, books <i>Stretch It!</i> by Anne Linehan, and <i>The Greedy Triangle</i> by Marilyn Burns
BACKGROUND	In the book <i>The Greedy Triangle</i> , a triangle is dissatisfied with his shape. The triangle complains to the shapeshifter, who changes him into a new polygon by adding another angle and another side. Soon the shape is not content being a quadrilateral, and returns to the shapeshifter to have another angle and side added. This continues until the shape has so many sides and angles that it rolls as easily as a circle. The book introduces the correct geometric terminology each time the triangle is changed into a new shape.
DIRECTIONS	Read the book, <i>The Greedy Triangle</i> . After the children are familiar with the story, implement the following lessons.

Elastic Loops

To prepare for this activity make enough elastic loops so there is one loop for all your children. A loop can be made by tying together 1 1/2 yards of 1/2" elastic into a circle. An alternative to using elastic loops is to have your children use a Chinese jump rope.

As you reread *The Greedy Triangle*, have pairs of children use the elastic to form the polygons described. Be sure to stop after each polygon and give the children the opportunity to observe and comment about the similarities and differences in the elastic shapes. For example, some triangles may be equilateral, while others may be right triangles. You may have many forms of quadrilaterals: rectangles, squares, trapezoids, and so on.

Geoboard Shapes

Another time, read *The Greedy Triangle*, and then have the children build a triangle on a geoboard using rubberbands. After building on the geoboard have children record their triangles onto geoboard dot paper. Ask children to share the triangles they have made. They will notice that not all the triangles are identical. Ask questions such as:

- ✓ How are all these shapes alike?
- ✓ How are they different?
- ✓ Are they all triangles?
- ✓ How do we know they are triangles?
- ✓ What makes a triangle a triangle?

This discussion should lead the children to develop a class definition of a triangle. This may include statements such as, "A triangle has three sides. A triangle has three angles." The children's recordings of a triangle can be displayed accompanied by their definitions.

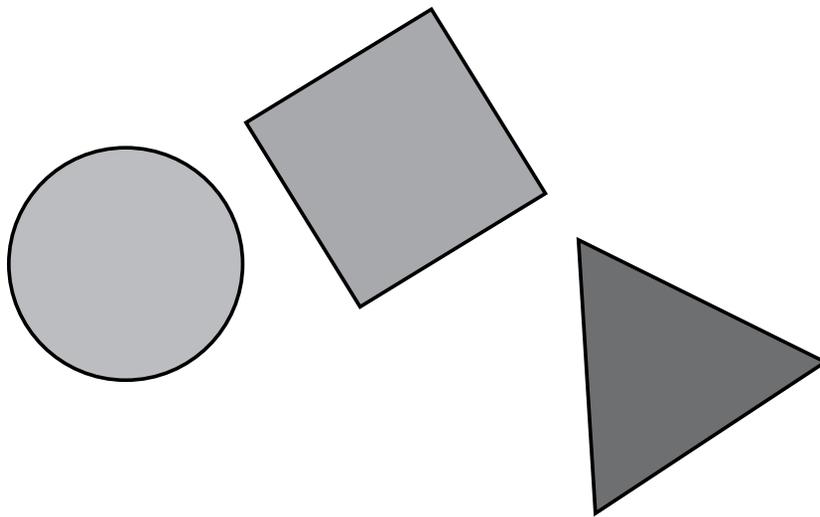
Use the example of the Greedy Triangle becoming a quadrilateral to challenge your children to find a variety of quadrilaterals on their geoboards. This activity should generate squares, rectangles, trapezoids, parallelograms, and so on, reinforcing the shapes discussed with the elastic loops. This is a springboard to create a definition for each quadrilateral.

Continue this process for each polygon that is introduced in *The Greedy Triangle* as the triangle visits the shapeshifter.

Picture Glossary of Polygons

After exploring the polygons introduced in *The Greedy Triangle*, have your children make the mini-book *Picture Glossary of Polygons* found in *Stretch It* by Anne Linehan. This activity provides an opportunity to revisit the shapes introduced in *The Greedy Triangle*. Children build polygons—triangles, quadrilaterals, pentagons, hexagons, octagons and decagons—on a geoboard. Then they record their geoboard shapes in the *Picture Glossary of Polygons*, which becomes an eight-page mini-book. The directions and the blackline master for the glossary are found on pages 49 and 50.

If you have a mathematics word wall in your child's room, this would be a perfect opportunity for you to add these words along with a diagram of each of the polygons.



REFERENCES

Burns, Marilyn. *The Greedy Triangle*. New York: Scholastic, 1995.

Linehan, Anne. *Stretch-It!* San Diego: Teaching Resource Center, 1992.



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Student Activity Sheets follow...

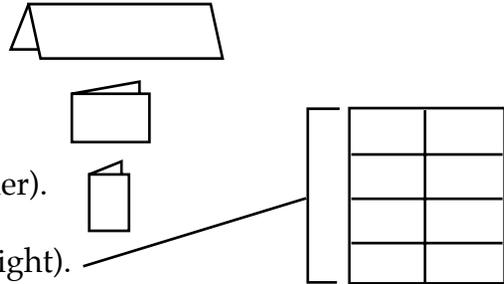
Exploring Polygons Fold a Glossary Book

by Anne Linehan

Fold-A-Book Instructions

1. Fold a rectangular sheet of paper into eighths.

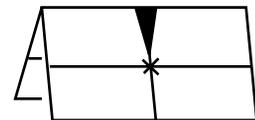
- Fold in half lengthwise (hotdog fold).
- Fold in half again (as for a book).
- Fold in half again (to make the book smaller).
- Unfold the sheet and count the sections (eight).



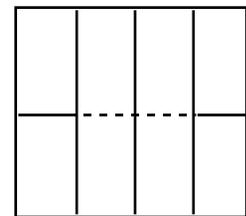
2. Fold in half width-wise (tent or hamburger fold)



3. Cut or tear along the center crease from the folded edge to the middle of the paper.



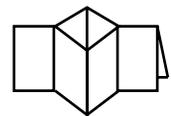
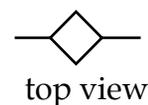
4. Open the sheet again.



5. Return to the first fold, lengthwise (hotdog fold).

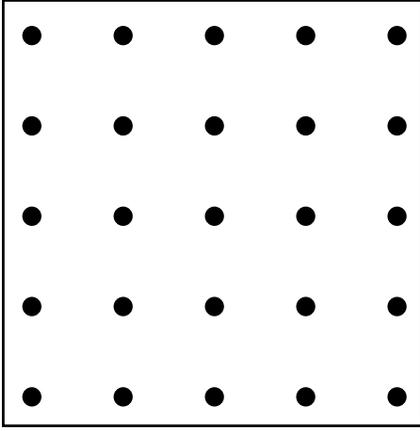


6. Hold the ends of the lengthwise fold and push them toward the center to form a cross that can be folded into a little book.

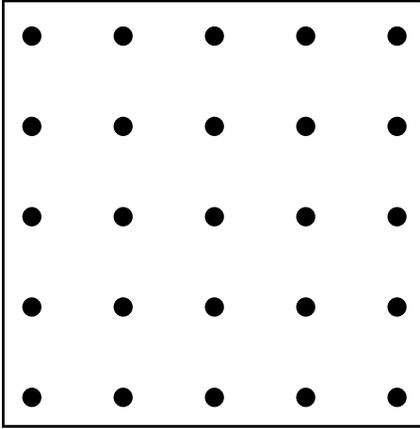


Exploring Polygons
Picture Glossary of Polygons
by Anne Linellian

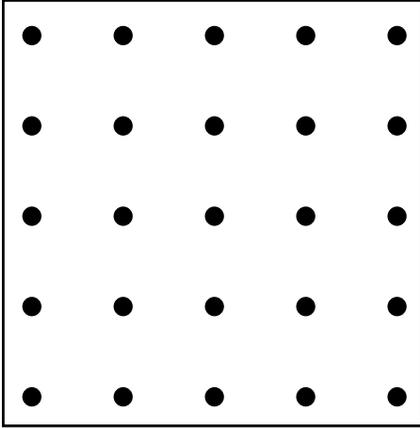
A triangle has three sides.



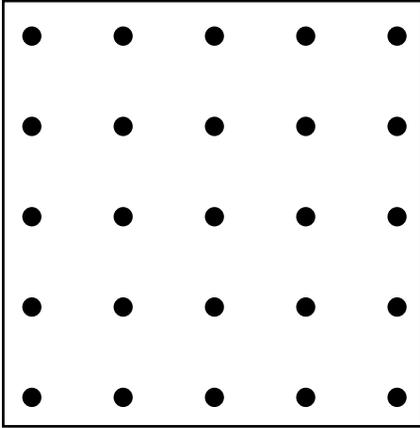
A quadrilateral has four sides.



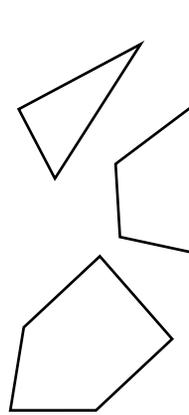
A pentagon has five sides.



A hexagon has six sides.



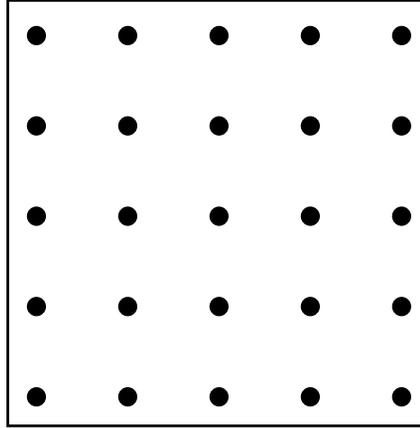
Picture Glossary of Polygons



Geoboard dot paper illustrations designed by

name _____

A decagon has ten sides.



An octagon has eight sides.

