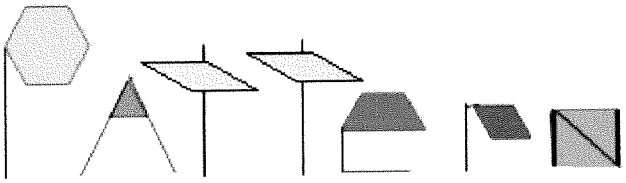

BLOCKS and POWER Polygons

What can be more geometric than the shapes in pattern blocks? There is an extended set of pattern blocks called Power Polygons – the basic set of six pattern blocks and nine more related shapes – a larger square, an equilateral triangle, a rhombus, a rectangle, two different isosceles triangles, and a scalene right triangle. Power Polygons allow students to study congruence, similarity, angle relationships, and algebraic equivalence.

For instance....
Since all of the polygons are easily recognized by their color and letter, find polygon G. Now, using an area model, write some number sentences that describe combinations of shapes that equal the area of polygon G.

example: G = I + 4N
How many more can you find?

Are your students having trouble with fractions?
Try this... find all of the pairs of shapes that have the same area as a bigger polygon in the set. Each one of these smaller ones is $\frac{1}{2}$ of the bigger shape.

N = _____ + _____ I = _____ + _____

_____ = _____ + _____ _____ = _____ + _____

What about shapes that show thirds? fourths? sixths? eighths?

How do you know that you've found all of the possibilities?

Are fifths or sevenths possible? Why or why not?

If polygon G represents one whole, what are the fractional names for the rest of the pieces?

example: G = N + K + N + K 1 = 1/8 + 3/8 + 1/8 + 3/8
Find some more:

Here's a challenge: Polygon O is has exactly one half of the area of what other polygon in your set? Be able to provide a convincing argument using your power polygons for your choice. (NOTE: You cannot break the pieces to show this.)

Here's another challenge: Can you find a way to divide any regular hexagon into 8 congruent pieces? Show this with your power polygons.

Power Polygons have been supplied by and are marketed by ETA. (NCTM Booth # 327)