Subject- Algebra

Unit- Polynomials

Objectives-

1. use geometric models to gain insights into, and answer questions in, other areas of mathematics;

2. use geometric ideas to solve problems in, and gain insights into, other disciplines and other areas of interest such as art and architecture.

Materials -
- Construction paper or fabric scraps in several different colors
- Scissors
- Rulers
- Glue sticks
- Thread
- Fabric for back of quilt

Duration- 2 to 5 days (dependent on which activities are chosen for the class)

Student Capacity - two students a day sewing their blocks.

Student Organization

Activities
    A. The Basic Activity-

1) This is based on the basic multiplication of $(x + y)(x + y)$. Using construction paper in several colors. Cut two small strips 1 inch by however many inches for the "x" dimension. Any dimension is appropriate. One inch is suggested as a width so that the paper quilts are easy to work with. Label these two "x."

2) Cut another two small strips one inch by however many inches for the "y" dimension. Label these "y." Students have now determined the "value" of their variables.

3) Glue the "x" strips in place on the backing material, one on the top edge and one to the left side. Glue the "y" strips in place on the backing material, next to the "x" strips.

Diagram 1

"x" strip	"y" strip

"x" strip

"y" strip

Background paper
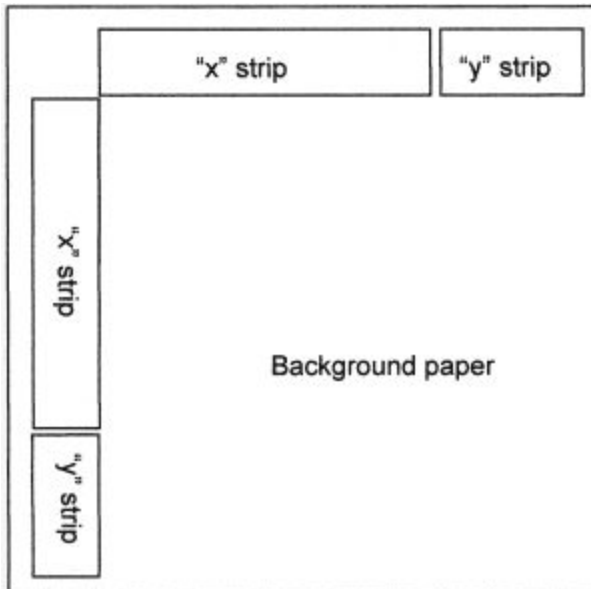
4) Measure the "x" strip. Students will now cut out a square in the same color as the "x," using the dimension of the "x" as the measure of one side of the square. In using the FOIL method, students have just multiplied the two First terms, x times x, to get an x-squared. This gets glued into place under and next to the "x" on the backing.

Diagram 2

|	
"x" strip	"y" strip

"x" strip

x squared
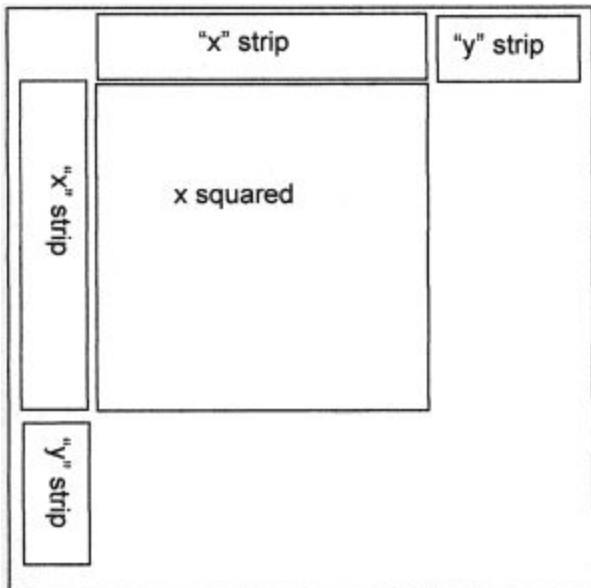
"y" strip

5) Measure the "y" strip. Students will now cut two rectangles in a "blend" of the "x" and "y" colors (if possible). One side of the rectangle will be the measure of "x" and the other side will be the measure of "y." Using the FOIL method, students have just multiplied the Outer and Inner terms (x times y and y times x). Have students wait to glue these into place, as they will want to intuit that every polynomial can be represented as a square or rectangle, and then determine where these pieces fit.

Diagram 3

| "x" strip	"y" strip
x squared	"xy"
"xy"	
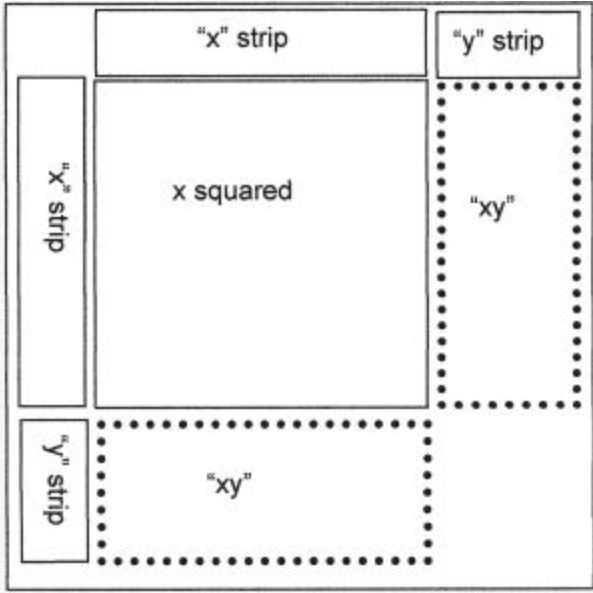
6) With the "y" measurement, students will now cut out a square in the same color as the "y," using the dimension of the "y" as the measure of one side of the square. In using the FOIL method, students have just multiplied the two Last terms, y times y, to get a y-squared.

7) Now have students determine where all the pieces will fit to create a rectangular model of this polynomial. just like a beginning multiplication table, the pieces need to fit under their specific dimensions.

Diagram 4

"x" strip	"y" strip
x squared	"xy"
"xy"	y squared
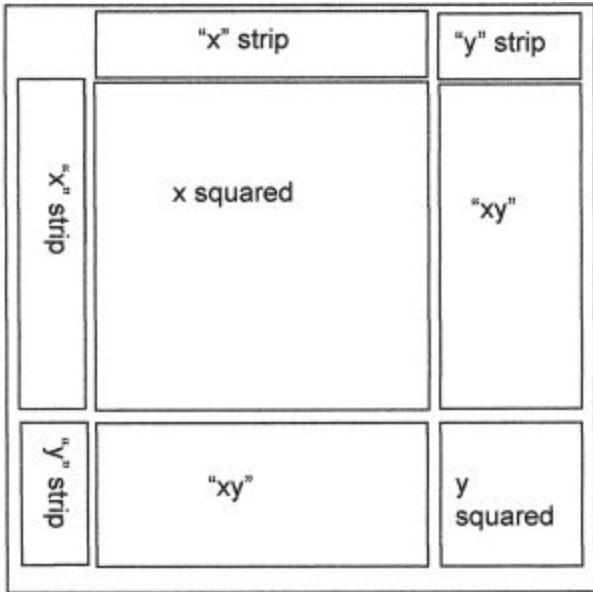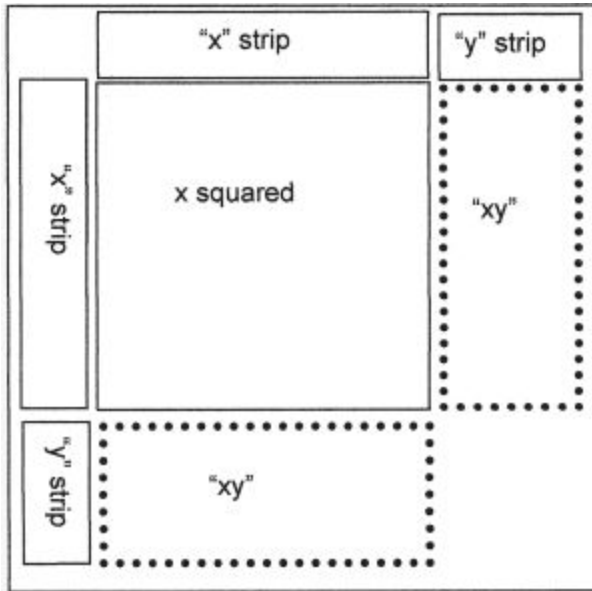
Closure-

Assessment-

Special Considerations-
Teachers could choose to skip the construction paper steps to this activity. Students could use pre-cut fabric to create their polynomials.