MAKING A QUILT

- • Spatial visualization
- • Looking for patterns
- • Transformational geometry
- • Congruence

Getting Ready

What You'll Need

Tangrams, 2 sets of 2 different colors per pair

Nine-Patch Quilt outline, 1 per group, page 92

Crayons or markers (red, yellow, blue, green)

Construction paper (6-in.-square piece), 1 per group

Paste

Overhead Tangram pieces and/or *Nine-Patch Quilt* transparency (optional)

Overview

Children make paper quilts based on quilt-square patterns they design using Tangram triangles. In this activity, children have the opportunity to:

◆ explore relationships among Tangram pieces

◆ arrange Tangram pieces to form a design

◆ repeat a design to form a pattern
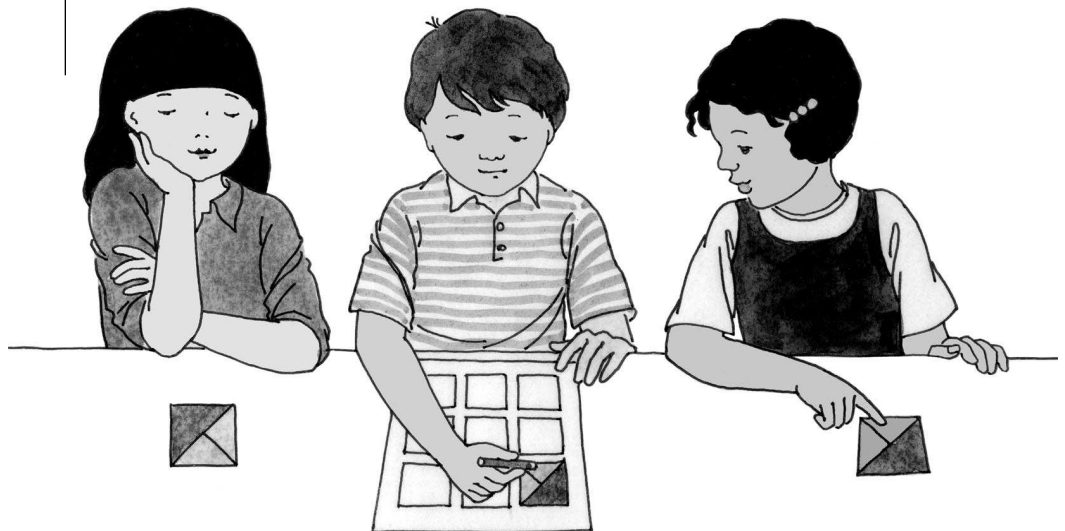
The Activity

You may want to familiarize children with the history of patchwork quilt-making and with some of the many possible quilt patterns by reading aloud from any of the following books: A Cloak for the Dreamer, Eight Hands Round: A Patchwork Alphabet, The Keeping Quilt, The Josefina Story Quilt, Texas Star, and The Patchwork Quilt.
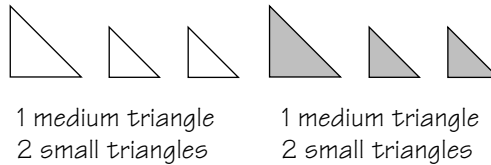
Introducing

◆ Hold up two Tangram parallelograms of different colors. Explain that these pieces can be used together to make different designs.

◆ Invite volunteers to model the ways in which the parallelograms can be put together with complete sides touching to form designs.

◆ Call for a show of hands, allowing children to vote on the design they like best.

◆ Record the preferred design in color in the middle of a piece of Tangram paper.

◆ Now, challenge children to suggest how you could make a pattern by repeating the design on the paper using crayons alone.
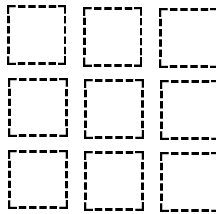
◆ Follow children's directions, then display the pattern.

On Their Own

> ### How can you use Tangram pieces to make a quilt pattern?
>
> - Work in a group. Take these Tangram pieces from 2 sets of different colors.
>
>   1 medium triangle
>   2 small triangles
>
>   1 medium triangle
>   2 small triangles
>
> - Use any 3 of the pieces to make a square design.
>
> - Record your design in each of the squares on a piece of Nine-Patch Quilt paper that looks like this:
>
> - Cut out each square.
>
> - Arrange the squares in 3 rows and 3 columns. You may exchange 1 square for another until you find the pattern you like best.
>
> - Paste your pattern on construction paper to make a quilt.
>
> - Be ready to talk about how you made your design and your quilt.

The Bigger Picture

Thinking and Sharing

Have children post their quilts. You may wish to have quilts of like colors grouped together to make it easy to compare them.

Use prompts such as these to promote class discussion:

- How did you decide which Tangram pieces to use for your design?

- What words can you use to describe your design?

- How did you decide on your pattern when you were putting the nine squares together?

- How could different patterns be made from your design?

- Are any of the posted patterns exactly like yours? Which ones?

- Would any patterns that are different from yours become exactly the same if some of the designs were turned? if some of the pieces in the design were flipped? Explain.

Extending the Activity

Have groups begin the activity again. This time, have them fill two *Nine-Patch Quilt* outlines. Direct children to record and color their design on one of the outlines to match the Tangram pieces they used. On the other outline, have them record their design using a different color scheme. Distribute
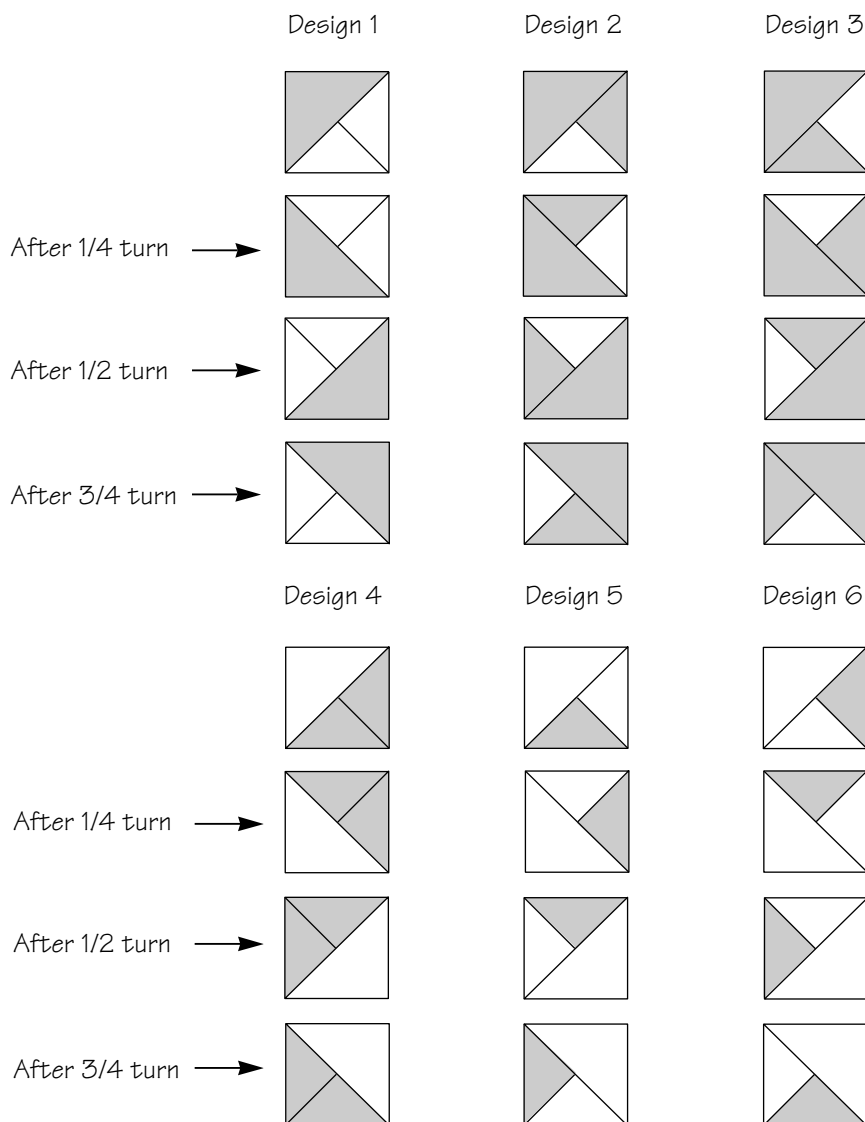
Teacher Talk

Most children will have no problem fitting their Tangram pieces together to form a square. If they do have trouble, have them start by positioning the medium triangle so that the square corner of the triangle matches one of the square corners of a quilt-square outline.

Where's the Mathematics?

As children repeat a pattern to form quilt patterns, they have many opportunities to use the language of geometry. Children may be surprised that the simple square design, when repeated, can make a visually exciting pattern.

With three pieces in two colors to choose from, children can make six unique square designs. You may want to point out how each design looks after 1/4, 1/2, and 3/4 turns. The designs below have been turned to the left.

	Design 1	Design 2	Design 3
After 1/4 turn			
After 1/2 turn			
After 3/4 turn			

	Design 4	Design 5	Design 6
After 1/4 turn			
After 1/2 turn			
After 3/4 turn			

6-by-12-inch pieces of construction paper, each folded into eighteen squares. Tell the groups to cut out and combine their pieces to make a pattern of squares in six rows and three columns. Have them then paste their pattern on the construction paper to form a double-size quilt.

As children record Tangram pieces to make their square designs, they may observe that a quilt square can be divided into two medium Tangram triangles and that two small Tangram triangles cover the same space, or have the same area, as the medium Tangram triangle.
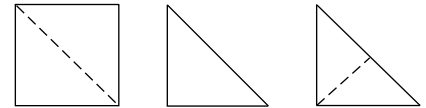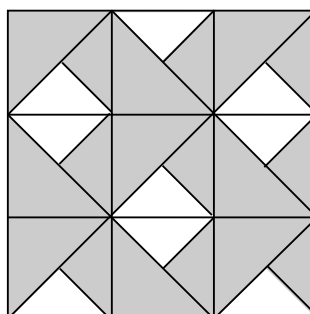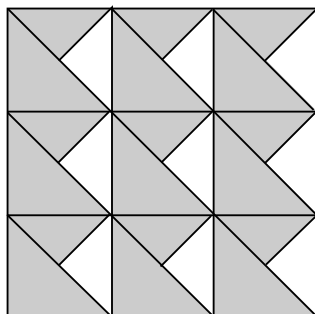

In pasting their designs to make a quilt, some children may have difficulty turning the squares to make a consistent pattern. Children who are able to identify their pattern in some way may have an easier time repeating it. For example, some children may say that they see their pattern as forming mountains, a road, or the letters K or V.

As children discuss the completed quilts, some may notice that small shapes in the square design can become parts of the pattern in the quilt. Children with a good sense of spatial visualization may see that changes in the color and direction of the original design may result in dramatic changes in the overall appearance of the quilt.

One group's quilt may look like this.
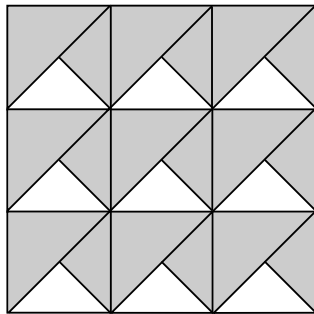
Notice how the pattern above would look if some of the squares undergo a 1/4 turn, then if some of the pieces in the original design are flipped.