E X P L O R A T I O N S

Activity 7

Quilt Block Areas

Teacher Notes

Prerequisites

Prior to this activity, students should have experience finding areas of rectangles and triangles. No prior calculator use is required: experience with [FracMode], [/], [▸Simp], [▸D], and [▸%] keys would be helpful.

Problem

1. Create one of the given traditional quilt block designs on graph paper and color using three colors.

2. Determine the fraction of the overall area of the design for each color and fill in the chart with the decimal and percent equivalents for each fraction.

Activity

A study of traditional quilt block designs is popular with middle school students. You can introduce them to the topic using an informative book such as *The Quilt-Block History of Pioneer Days* by Mary Cobb. (See list on page 60.)

Have students create one of the three given quilt block designs on graph or centimeter squares paper. For all these designs a 36 x 36 grid works nicely.

Answers for Student Activity Sheet:

Quilt Block Color	Fraction of Total Area	Decimal	Percent
Album			
White	1/4	.25	25%
Light	1/2	.5	50%
Dark	1/4	.25	25%
Signature			
White	1/3	$.\overline{3}$	$33.\overline{3}\%$
Light	1/3	$.\overline{3}$	$33.\overline{3}\%$
Dark	1/3	$.\overline{3}$	$33.\overline{3}\%$
Hole in Barn Door			
White	1/9	$.\overline{1}$	$11.\overline{1}\%$
Light	4/9	$.\overline{4}$	$44.\overline{4}\%$
Dark	4/9	$.\overline{4}$	$44.\overline{4}\%$

After students complete and check each other's charts, they can present their results to the class. It is also valuable to have students share their paragraphs since different students will view the designs in different ways.

Note: For most middle school students, the [▸%] key should be used only to verify students' mental math when changing from decimal to percent. In fact, for many quilt block designs students can use mental math to find all the equivalents.

Assessment

Students' completed designs and charts can serve as an assessment tool to check their understanding. Also, giving students another quilt block design is appropriate.

Extensions

♦ Students can choose another traditional quilt block design and carry out the assignment, using four or more colors.

♦ Students can make up an original quilt block design, using symbols and colors that are important to them and carry out the assignment.

♦ Give a fixed area for a quilt block and a fixed amount of available cloth for 3 (or 4) different colors. Have students design one or more possible patterns for the quilt block.

Some Books About Quilts

There are many lower level books involving quilts. The books listed here are chapter books or books with a theme particularly relevant to most middle school curricula.

Story/Chapter Books

Blos, Joan. *A Gathering of Days.* New York: MacMillan, 1979.

Ernst, Lisa. *Sam Johnson and the Blue Ribbon Quilt*. New York: Lorthrop, Lee and Shepard, 1983.

Hopkinson, Deborah. *Sweet Clara and the Freedom Quilt*. New York: Alfred A. Knopf, 1993.

Polacco, Patricia. *The Keeping Quilt.* New York: Simon and Schuster, 1988.

Kinsey-Warnock, Natalie. *The Canada Geese Quilt*. New York: Cobblehill Books/Dutton, 1989.

Love, D. Anne. *Bess's Log Cabin Quilt*. New York: Holiday House, Inc., 1995.

Rinaldi, Ann. *A Stitch in Time*. New York: Scholastic, Inc., 1994.

Rinaldi, Ann. *Broken Days*. New York: Scholastic, Inc., 1995.

Ringold, F. *Tar Beach*. New York: Simon and Schuster, 1991.

Tenorio-Coscarelli, Jane. *The Tamale Quilt.* Murrieta, CA: 1/4 Inch Designs and Publishing, 1988.

Walker, Alice. "Everyday Use" (short story) and "In Search of Our Mothers' Gardens" (essay).

Wright, Courtni. *Jumping the Broom*. New York: Holiday House, 1994.

Informational Books

Cobb, Mary. *The Quilt-block History of Pioneer Days.* Brookfield, CT: Millbrook Press, 1995.

Fry, Gladys-Marie. Stitched from the Soul: Slave Quilts from the AnteBellum South. New York: Dutton Studio Books, 1990.

Nadelstern, Paula. *Color Design in Patchwork*. New York: Dover Publications, Inc., 1991.

Paul, Ann Whitford*. Eight Hands Round*. New York: Harper Collins, 1991.

Paul, Ann Whitford. *The Seasons Sewn.* New York: Harcourt Brace, 1996.

Soltow, Willow Ann. *Quilting the World Over*. Radnor, PA: Chilton Book Company, 1991.

Willing, Karen B. *Quilting Now and Then*. New York: Now and Then Publications, 1994.

Teacher Resources

Cohen, Luanne. *Quilt Design Masters*. Palo Alto, CA: Dale Seymour, 1996.

Franco, Betsy. *Textile Math*. Mountain View, CA: Creative Publications, 1996.

Martin, Judy. *Ultimate Book of Quilt Block Patterns.* Denver, CO: Crosley-Griffith Publishing Company, 1988.

Morrow, Char. *Mathematical Investigations With Quilts*. Roy, WA: A Small Woodworking Company, 1996.

Venters, Diana and Ellison, Elaine Krajenke. *Mathematical Quilts*. Berkeley, CA: Key Curriculum Press, 1999.

Related Web Sites

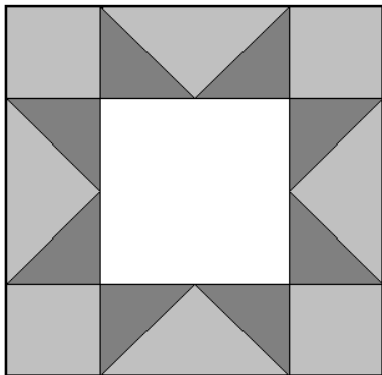http://planetpatchwork.com/tesselat.htm

http://www.quiltgallery.com/

http://www.quiltgallery.com/tessohio.htm

http://www.quilttalk.com/links.html

http://www.animas.com/

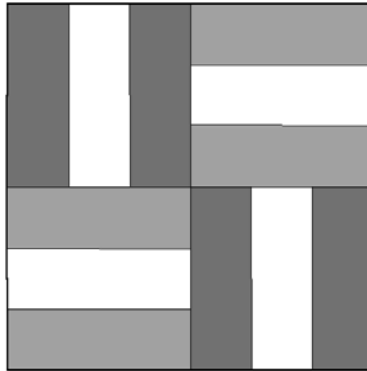http://www.quilt.com/MainQuiltingPage.html

Activity 7

Quilt Block Areas

Objective: *You will draw and color scale drawings of traditional quilt block designs, then find the appropriate fraction, decimal, and percent of the overall design for each color.*
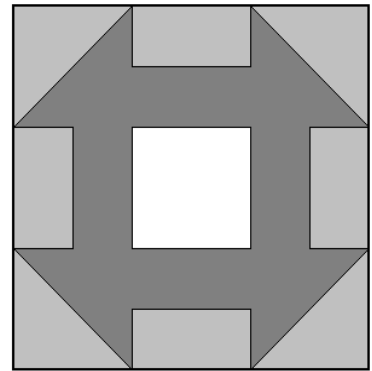
Throughout history women have made quilts. There are many designs that have been used over and over. One popular group of patterns is called album quilts. Each quilt block in such a quilt is designed and signed by a different person. Traditionally, they were given as marriage gifts or to families who were moving away. Quilt makers use many different quilt block designs to make these quilts. Below are three popular designs used in album quilts.

Album   Signature   Hole in the Barn Door

Problem

1. Choose one of the three designs above and draw it on graph paper. Color your design using three colors.

2. Find the total area of each color and complete the chart on the next page. You may use your calculator to help you complete the chart.

Areas in _____Quilt Block Design

Color	Fraction of Total Area	Decimal	Percent

Write a paragraph explaining how you know your fraction is correct by *looking at* the quilt block.

Quilt Block Areas
Keystrokes for the TI-34 II

To change a fraction to a decimal:

Example: $\frac{1}{5}$

PRESS	DISPLAY
[2nd] [FracMode] [ENTER]	A⌴b/c <u>d/e</u> (use arrow key, if needed, to underline d/e)
1 [/] 5	1/5
[▸D] [ENTER]	1/5 ▸ D 0.2

or

1 [÷] 5 [ENTER]	1÷ 5 0.2

To change a decimal to a percent,

Example: *.625*

PRESS	DISPLAY
.625 [2nd] [▸%] [ENTER]	.625 ▸% 62.5%

Quilt Block Areas
Keystrokes for the TI-30X IIS

To change a fraction to a decimal:

Example: $\frac{1}{5}$

PRESS	DISPLAY
1 [Ab/c] 5 [ENTER]	1˩5 1/5
[2nd] [F↔D] [ENTER]	Ans ▸ F◂▸D 0.2

or

PRESS	DISPLAY
1 [÷] 5 [ENTER]	1/5 0.2