

Design a Quilt

Math Concepts

- whole numbers
- 2-dimensional geometric figures
- addition

Materials

- TI-10
- **Design a Quilt** recording sheets
- Pattern Blocks
- crayons or markers

Overview

Students will use Pattern Blocks to build a design. Then they will use the calculator to determine the value of the design.

Introduction

1. Read a quilting story, such as *The Patchwork Quilt* by Valerie Flournoy, to students and discuss the different geometric figures used in the quilt in the story.
2. Have students build a small quilt design using Pattern Blocks or the paper pattern blocks provided on page 40. Then have them transfer the design to the triangular grid on their recording sheets using crayons or markers.
3. Next, have students assign a value of 1¢ to the green triangle and use the calculator to figure the value of the quilt design.
4. Have each student record the value of the design on the back of their recording sheets, trade designs with another student, and figure the value of their partner's design.

Note: Other quilting stories include: *The Keeping Quilt* by Patricia Polacco, *Sweet Clara and the Freedom Quilt* by Deborah Hopkinson, and *Sam Johnson and the Blue Ribbon Quilt* by Lisa Ernst.

Collecting and Organizing Data

While students are constructing and recording their quilt designs, ask questions such as:

- What Pattern Blocks are you using in your design? Did any of the blocks seem to not work when you recorded your design on the triangular grid paper? Which ones?



How are you using the calculator to help you find the value of your design?



How can you use $\square\text{Op}\square$ on the calculator to help you find the value of your design?

Design a Quilt (*continued*)

Collecting and Organizing Data (*continued*)

- How many green triangles do you think it will take to build the red trapezoid shape? Try it and see. How about the blue parallelogram? The yellow hexagon? Predict first and then find out.
- If we assign a value of 1ϕ to the green triangle, how much do you think your whole design is worth? How could you find out? Is there any other way to find the value of your design? Think of one other way, try it, and see if your value remains the same.

Analyzing Data and Drawing Conclusions

After students have recorded the value of their designs, have them work as a whole group to analyze their triangular grids. Ask questions such as:








- How did you predict the number of green triangles it would take to build the other blocks? Your whole design?
- How could you describe the way you found the value of your design?
- Whose design has the greatest value? The smallest value?
- How many methods of finding the value of your design did you try? Did your value remain the same each time? If not, why do you think it changed?

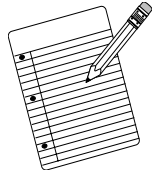
Continuing the Investigation

Have students:

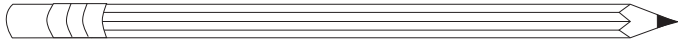
- Change the value of the shapes and find the new value of their designs.

Example: If your design was worth 45ϕ when the green triangle had a value of 1ϕ , how much do you think it would be worth if the green triangle had a value of 5ϕ ? Predict first and then find out. If you made a quilt that used this same design nine times, how much would the whole quilt be worth?

-  What operations can you use on the calculator to help you find the value of your design?
-  How can you decide if the answer you are getting on the calculator is reasonable or not?
-  How can you use the constant or [Op] feature to determine the value of your quilt?
-  How did you use the calculator to help you find the value of your design?
-  What operations did you use on the calculator to help you find the value of your design? Which one do you think worked the best?
-  Does the order in which you entered the numbers in your calculator matter? Why or why not?
-  If you changed the value of the green triangle to 2ϕ , how would you change the way you used the calculator? What would stay the same?



Name:

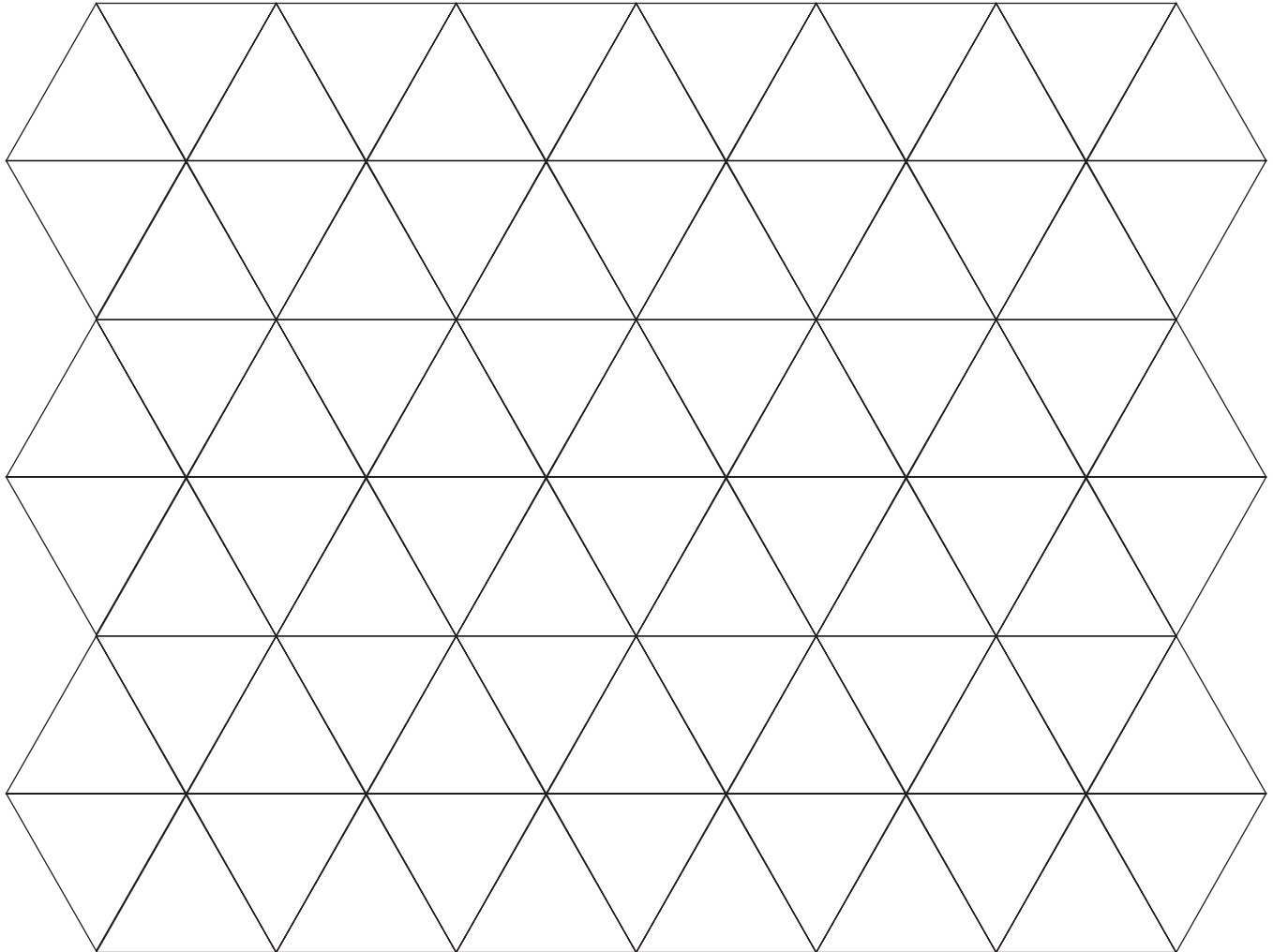


Design a Quilt

Recording Sheet

Collecting and Organizing Data

Record your quilt design below.



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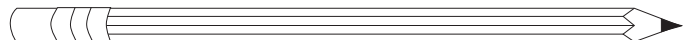
Analyzing Data and Drawing Conclusions

Record the value of your design on the back of this paper.

Questions we thought of while we were doing this activity:



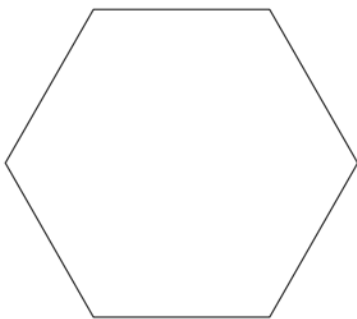
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Design a Quilt

Pattern Blocks

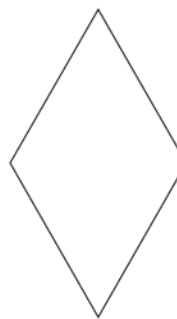
hexagon



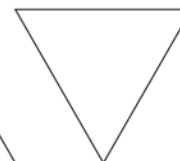
trapezoid



rhombus



equilateral triangle



Other Geometric Shapes

