

The Banquet Guests

Purpose

Students will understand that rectangles with the same area can have different perimeters by comparing the number of guests that can be seated around different sizes of banquet tables.

Materials

For the teacher: chalk, chalkboard, 32 two-inch square pieces of construction paper, tape, yard stick

For each student: 24 square-inch tiles, copy of Black Line Master (BLM) *Banquet Guest Blues*

Activity

A. Pre-Activity Preparation

1. Cut from construction paper 32 squares that are 2" on each side.
2. Roll 32 pieces of tape (sticky side out). Place them in a location near the chalkboard.

B. Introduction

1. Draw a 4" × 16" rectangle and an 8" × 8" rectangle on the chalkboard.
2. Ask students which rectangle has the larger area and which has the larger perimeter. Review the definitions of area and perimeter, if necessary.
3. Tell students that they will be exploring different sizes of rectangle to compare their perimeters. Tell them that they will do this by imagining that they must seat banquet guests around different size tables.

C. Student Activity

1. Hand 24 square-inch tiles and a copy of the BLM *Banquet Guest Blues* to each student.
2. Tell the students to imagine that each of the squares is the top of a table just big enough for one guest. Tell them that each guest could sit at a table by himself or herself, but that wouldn't be very fun and would leave no room for the food. Inform students that their job is to arrange all of the small tables together into one large table. The only rules are that the large table must be a rectangle and there must be no "holes" in the center of the table.

(continued)

EXTENDING
THE



ACTIVITY

Divide the class into groups of 4-5 students. Have students choose the table design that they believe would work best for their banquet. Instruct the groups to draw pictures (manually or electronically) or create 3-D versions of their tables and make presentations to the class on why their table design is best.

MEETING
INDIVIDUAL



NEEDS

For students having difficulty understanding these concepts, give them a geoboard and a large rubber band. Have them find different ways to make a rectangle with 24 small squares inside the rubberband. Have students find the perimeter of each rectangle.

Standards Links
4.2.1, 4.2.2, 4.3.2




Activity (continued)

3. Have students see how many ways they can create the large table. Have them keep a record of the number of guests that can be seated at each large table they have created on the BLM. Tell students that at corners a guest must sit on both of the exposed sides of the small table in that corner.
4. Discuss the results that the students found.
5. Referring to the rectangles on the chalkboard, ask students if it might be possible that two of the rectangles have the same area.
 - a. Using the tape, have one student place the 2" squares into one of the rectangles.
 - b. Have two more students move the squares into the other rectangle to fill it.
 - c. Tell students that the conclusion is that the $4" \times 16"$ rectangle and the $8" \times 8"$ rectangle have the same area. Have students check your conclusion by using the formula for finding the area of a rectangle.
6. Find the perimeters of these two rectangles and observe that they are not the same.

Questions for Review

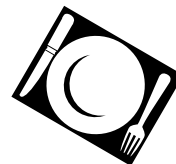
Basic Concepts and Processes

During the activity, discuss the following questions with students to gauge their understanding of the indicator:

-  Is it possible for two rectangles to have the same area, but have different perimeters?
 -  Show me an example on your BLM where this is true.
 -  How did you create a table that was a different size, but still used exactly 24 squares?
-

Name: _____

Banquet Guest Blues



Create large tables of different size rectangles using exactly 24 small tables (square-inch tiles). The rules for creating the large tables are:



1. The large tables must be rectangles.
2. The large table must not have any "holes" in its center.
3. A small table in a corner will have a guest seated on both of the exposed sides.



Record your results in the table below:



Number of Guests Seated Along Top of Table (Length)	Number of Guests Seated Along Side of Table (Width)	Total Number of Small Tables Used (Area)	Total Number of Guests Seated Around Table (Perimeter)
		24	
		24	
		24	
		24	
		24	
		24	
		24	
		24	

Banquet Guest Blues

Teacher Directions

Have students fill in the tables as they do the activity. Review the rules and directions with the students, demonstrating examples if necessary.

Answer Key

Answers need not be in this order within each table, but could include any of the answers shown.

Number of Guests Seated Along Top of Table (Length)	Number of Guests Seated Along Side of Table (Width)	Total Number of Small Tables Used (Area)	Total Number of Guests Seated Around Table (Perimeter)
3	8	24	22
8	3	24	22
6	4	24	20
4	6	24	20
2	12	24	28
12	2	24	28
1	24	24	50
24	1	24	50

 You may choose to instruct students that similar answers such as these (same size table, only rotated) only need to be recorded once.