

TABLES AND PEOPLE

Objective: Use problem-solving skills to find the perimeter and area of rectangles.

Materials: Tables and People Activity Sheet and Transparency
Eight color tiles for each pair of participants
20 transparent color tiles for the leader

Procedures:

1. Pass out eight color tiles and a "Tables and People" activity sheet to each participant.
2. Place one of the transparent color tiles on the overhead projector and explain that it represents a small square table. It will seat four people, each with equal "elbow room."
3. Tell participants that for this activity they will set up banquet tables. These banquet tables must be rectangular in shape, and they must be placed end-to-end, or side-to-side. Place a second transparent color tile on the overhead projector so that the two squares form a rectangle. Tell participants that this is a banquet table made up of two small square tables. Since one small square table seated four people, allowing each person an equal length of "elbow room", ask participants how many people this rectangular banquet table will seat. (6)
4. Put a third transparent color tile on the overhead projector, forming an even longer rectangular banquet table; ask participants how many people this banquet table will seat. (8) Explain that the **peRIMeter** is 8 people spaces. Ask how many small tables it took to form this banquet table. (3) Therefore, the area is three square tables.
5. Make sure all of the participants understand that the number of people seated at a table (with equal elbow room) is the **peRIMeter**, and the number of small tables needed to make a banquet table is the **AREA**. Now go back and start filling in the "Tables and People" transparency. Fill in the data using one table, then two, and then three small square tables. The participants should work in pairs with one partner building the model of the banquet tables, and the other recording the results on the "Tables and People" activity sheet. It will probably take two "Tables and People" activity sheets to record all the results.

6. Ask participants how many people can be seated around a rectangular banquet table made up by pushing four small square tables together. (10) Demonstrate this using the squares on the overhead projector. Ask the participants to fill this in on their "Tables and People" activity sheets as you fill in the "Tables and People" transparency. Since a square is a rectangle there is another way, other than putting the four small tables in a straight line, to arrange the four small tables. If you form a square with the four tables, how many people can sit around the tables? (8) However, the area remains the same. Add this arrangement to your "Tables and People" transparency and have participants add it to their activity sheet.
7. At this point ask the participants to build a banquet table out of five small tables. Instruct them to work together to fill in the "Tables and People" activity sheet for five small tables.
8. Repeat Procedure 7 with six, seven, and eight small tables. Note that six small tables can be arranged two ways. The area remains the same, but the perimeter changes (14 people one way and 10 people the other way). Seven tables will seat 16 people; and eight tables will seat either 18 or 12 people, depending which way you arrange them.
9. Conclude the activity with a discussion about perimeter and area. Some possible questions to ask are:
 - a) For all banquet tables that are rectangular and have the same area, which ones seat the most people? (the most elongated in shape)
 - b) For all banquet tables that are rectangular and have same area, which shape table seats the least number of people? (the most square shaped arrangement)
 - c) Do all of the banquet tables that seat the same number of people, that is that have the same perimeter, always have equal areas? (No)
 - d) Look at the banquet tables that have the same area. Do they always have equal perimeters? (No)

Notes:

1. Explain to the participants that there are many variations of this activity. Lead the group in a discussion of possible extension activities:
 - a) The tables could be required to be joined end-to-end or side-to-side, but not required to be rectangular in shape. Challenge students to find all possible combinations.
 - b) Gifted/talented students could be given 40 tiles and asked to form all possible banquet tables that would seat 24 people. They could explore this problem until they could not come up with any new combinations of tables. The areas could then be compared among the shapes with perimeters of 24.

