Party Seating

How should we sit? For the surprise feast we are giving for Katie's class, we need to figure out how we want to arrange the cafeteria. There are 14 rectangular tables we can use, each that can seat 3 people to a side and 1 person on each end.

If we need to seat 50 people for our party, what is the best way for us to arrange the tables? Remember, we discussed setting the tables up in a special way so that more people could sit together.

Show me the plans you come up with and tell me which arrangement you think is best and why. Do we need to use all 14 tables?

Bonus:

If we wanted everyone to sit at 1 big table, what could the table look like and how many smaller tables would be needed to make this larger table?

Reminder: Make sure all your representations are neat and clear.

Grade Levels 3 - 5

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Context

The class decided they wanted to give a special surprise feast for their teammates. They planned the menu, organized who would bring what in, changed school schedules with the cooks and other teams, created invitations, brainstormed decorations including table clothes and candles, and of course, wanted to rearrange the cafeteria so that it would be special. We discussed as a class that the more people that could sit together the better, although we were limited by the size of the cafeteria and the number of tables available to us. Aside from the physical layout of the tables, the students also did a seating chart for where they thought people would like to sit. This was a true challenge.... and a great experience for them... trying to make everyone happy. It was like one big puzzle.

What This Task Accomplishes

This task enabled the children to work on a meaningful problem that reinforced some of the often neglected NCTM standards: Geometry and Spatial Sense, Measurement, Connections, Reasoning and Problem Solving. The fact that the solution to this problem was a much needed part of an activity they chose to do helped the children to see clearly, "math in the real world."

What the Student Will Do

Most students will draw the tables on graph paper and begin putting people at the tables. Some

Exemplars

children assumed incorrectly that if eight people fit at one table, than 16 would fit at two tables pushed together. These children did not understand that pushing tables together lessened the number of seats available. Some students will want to go to the cafeteria and actually push the tables together as well as measure the tables and the room to make sure the tables fit!

Time Required for Task

Two to three, 45 minute periods

Interdisciplinary Links

This problem would work well with any party or table seating events even setting up the classroom.

Teaching Tips

Have all sorts of manipulatives available for the kids to use. Various sizes of graph paper as well as tiles, rulers, centimeter cubes, etc. If there is time, I would really encourage the kids to do several solutions and look for patterns in the solutions concerning the number of tables and the number of people. There are also plenty of observations to be made about long sides and short sides.

Suggested Materials

- Graph paper of various sizes
- Tiles
- Cubes
- Scissors
- Rulers and yard/meter sticks
- Calculators

Possible Solutions

Answers may vary depending on how the tables are arranged. It is important to make sure that the representations are correct and that children are accounting for lack of seating space where tables are pushed together. The point of this activity was to make larger groups more than just eight sitting together. Some children included parent volunteers and teachers, which was great.

Benchmark Descriptors

Novice

There is no solution to the task. There is no evidence of mathematical reasoning and no math language.

Exemplars

Apprentice

This student does show some evidence of mathematical reasoning although s/he does not completely solve the problem.

Practitioner

This student shows effective mathematical reasoning. S/he uses accurate representation and a strategy that leads to a solution. This student takes into account that at a social gathering you would not want only two people sitting at a table, s/he also acknowledges that having a greater number of tables allows more choice of seating.

Expert

This student takes into account that there are issues with boys and girls sitting together in tight quarters. The student applies procedures needed correctly and goes beyond the basic problem to tackle the bonus problem. S/he actively uses the representation as a means of communicating the solution.