Dinner Tables II

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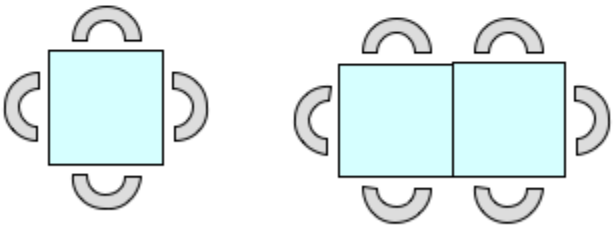
Summary	Students work with a function relating the number of tables (in a straight line) to the number of available seats. One table seats 4, two tables seat 6, three tables seat 8….
Goals	1. To understand how arrangements of tables changes the function relating number of tables and number of available seats.
Materials	Overheads, Handouts
Keywords	Contextualized Situations Full Class Discussion Interpretation of Stories Linear Functions Production of Algebraic Expressions Production of Tables

Activity Plan:

Notes: This lesson is similar to lesson '3.34 – Dinner Tables I: Separate Tables' where the tables are left separated creating a more simple function of $4n$.

1. Seating Arrangements: From Tables to People Seated [Whole Class]



Show the basic table arrangements we'll be working with on the table on the overhead of page 1.

The tables are put together, which influences how many people can be seated. (It is not the case that multiplying the number of tables by four yields the number of people who can be seated.)

Here are some questions to discuss:

How many people can sit in one table, two table, three tables…?

How about at 10 tables?

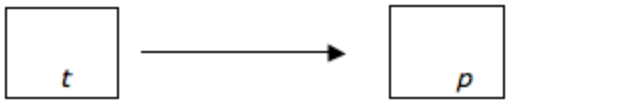
What about 100 tables?

What happens each time I add another table? How many more guests can be seated?

What operation(s) can I use to get from number of tables to maximum number of people that can be seated at the tables?

Make sure that they feel comfortable with multiplication, not just addition.

Discuss tables to seats as an input-output function, but at this point do not show the written mathematical expressions to the students.



Tables

(Maximum number of) people seated

As was the case in the previous lesson, students need to realize that multiplication is not simply repeated addition. We are also changing the nature of the thing itself. In this case, the ingredient we put into the function is "tables". We get out "seats" or "places to sit". This is what Schwartz (Schwartz, 1996) means when he says multiplication is "referent transforming".

2. Having the students fill in the data table [Whole Class]

It is important that the students first describe the pattern in their own words.

It is fine if they use a formula, but this is not required at the beginning.

Some children may find it difficult to determine the total number of people that could sit at 100 tables. Ask a few children how they would do that without having to draw all 100 tables.

Here are some possible answers (not all are correct)

You take the number of tables and you double it.

Take the number of tables and add one and then double it.

Take the number of tables, double it, and add two.

Write these (or other sentences) on the board and check them with the students. Which match the data? Which do not?

Then pose the following challenge to the students:

If t refers to the number of tables and p refers to the maximum number of people seated, what expression describes how you get from t to p?

Make sure they are aware of the difference between total number of people and number of people per table.

Discuss possible representation proposed by children. Through discussion they will eventually adopt correct expressions of the following forms:

$(t + 1) \times 2 = p$

$t \times 2 + 2 = p$

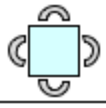
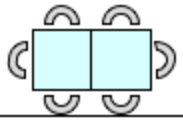
4. Homework (Page 2)

Distribute and explain the Homework. It is identical to today's handout, with only a slight change: tables have 6 sides. Emphasize that you want them to use their own words to express how to get from the number of tables to the maximum number of people that can be seated.

Overhead and Handout: Seating People at Joined Tables for 4 **(Page 1)**

Name: _____ Date: _____

In your restaurant, square dinner tables are always arranged together in a single line. Below, figure out the maximum number of people you can seat.

Dinner tables	Show how	Number of People
1		4
2		
3		
4		
5		
10		
100		

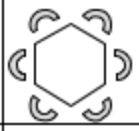
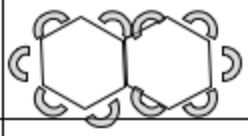
Each time you add another table to the line, how many new people can join the party?

If I tell you the number of dinner tables lined up, how can you figure out the maximum number of people that can sit down?

Overhead and Homework: Seating People at Tables for 6
(Page 2)

Name: _____ Date: _____

In your restaurant, hexagon dinner tables are always arranged together in a single line. Below, figure out the maximum number of people you can seat.

Dinner tables	Show how	Number of People
1		6
2		
3		
4		
5		
10		
100		

Each time you add another table to the line, how many new people can join the party?

[on the back side of this paper]: If I tell you the number of dinner tables lined up, how can you figure out the maximum number of people that can sit down?