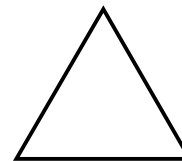# How Many Seats?

Rosa is very excited about the pizzeria that she is opening soon. Her cousin Vinnie says he knows a guy who can get tables for cheaper than anyone else. Rosa is thrilled and tells Vinnie to buy the tables.

When Vinnie comes back, this is what the tables look like from up above:

Rosa says, "Oh, Vinnie! What have you done? I can't have triangular tables in my restaurant! What if more than 3 people want to sit together?

Vinnie says, "No problem, Rosa. You can just stick the tables together in a row like this:"
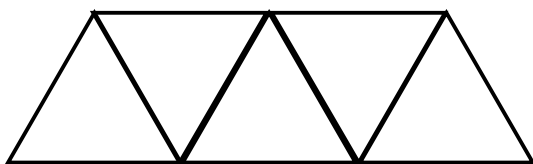
Rosa says, "But where will the chairs go?"

"No problem," said Vinnie, who always had an answer for everything. "We'll just put one chair in the middle of each side of a table like this"
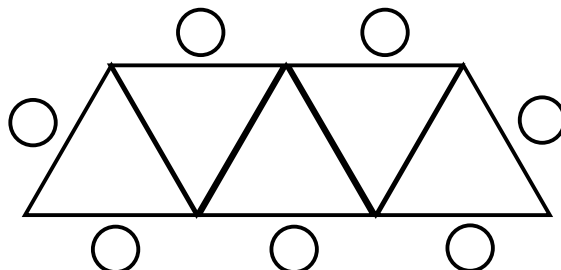
"But Vinnie," said Rosa, "how will we know how many chairs to put at each table when they are such funny shapes? We could figure it out every time, but it would be better if we had a way to predict how many chairs we will need if we know the number of tables."

"Well, Rosa," said Vinnie. "I got the tables. You can figure out about the chairs."

Rosa sighed, as she so often did when Vinnie was around.

Can we help Rosa? Can we find a way to predict how many seats we will need if we know the number of chairs?

Task #1. Counting Seats

Each person in your group will get a **Tables/Seats** slip. Take that number of tables from the bag of tables at your group, and line them up to make one long row. Count how many seats your long row will hold and put that number on your slip.

Recording your group's thinking on your chart paper:
- Draw horizontal lines to divide your chart paper into four sections.
- Put everyone's Tables/Seat slip at the top of the chart paper in an organized way.
- Discuss in your group how each person counted the number of seats. Record the different ways of counting in the next section of the chart paper.
- Leave the bottom two sections empty.

Task #2. Finding a Pattern

A. Do you see a pattern in the number of seats? Why do you think that pattern occurs?
- Find a partner to do **Structured Think Pair Share**
- Write your thinking about the pattern in the **Think** box.
- Listen to your partner's thinking. Summarize it in the **Pair** box.
- Discuss your ideas and your partner's ideas. See if you can come to agreement about the pattern. Write that thinking in the **Share** box.

B. Using **Talking Stick**, discuss the pattern you found with your group.

C. If the discussion made you change your mind, record your new thinking in the **Revising My Thinking** box.

D. Testing your pattern
Each member of your group will choose 1, 2 or 3 more tables from the bag on the table. Predict how many seats you will need if you add these tables to your original long row. Then add the tables and count.

Was your prediction correct? Record your test on your My Thinking sheet.

E. On your chart paper, in the next section record your group's understanding of the pattern and why that pattern occurs.

Task #3. Writing the Pattern as an Equation

Now turn your pattern into an equation. In your equation, use these symbols
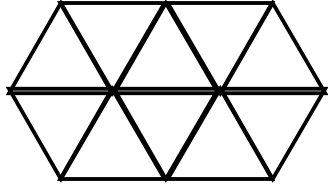
S = the number of seats T = the number of tables

Write your equation on your My Thinking sheet.

If you whole group agrees on an equation, write it in the last section of the chart paper.
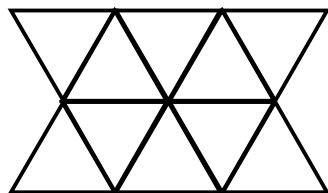
Task #4: Making Bigger Tables

Suppose Rosa would like to make a big wide table out of her small triangular tables, like this:

Can you predict how many seats you will need for any number of tables that make this kind of wide table?

Write an equation that expresses your prediction.

  Does it make a difference if we put the long tables together like this instead? Why or why not?

Can you predict how many seats you will need for any number of tables that make this kind of wide table?

Write an equation that expresses your prediction.

My Thinking About How Many Seats

I. What is the pattern? Why does that pattern happen?

Think – *your ideas go here*	**Pair** – *your partner's ideas go here*

Share – *talk to your partner, then put your shared understandings here*

Revising my thinking – *if you changed your mind about the pattern after the group discussion, write your new thinking here.*

Testing the Pattern

I added _____ tables to my original row of _____ tables.

I predicted that I would need _____ seats. My prediction was right / wrong (circle one)

II. Writing the equation

Write your equation here.