

Chapter 1
Lesson 1

Modelling Patterns

You will need

- counters
- square tiles

GOAL

Use models to represent, extend, and make predictions about number patterns.

The students in Rebecca's class are setting up tables for Parents' Dinner Night. They only have square tables, which seat one person on each side.

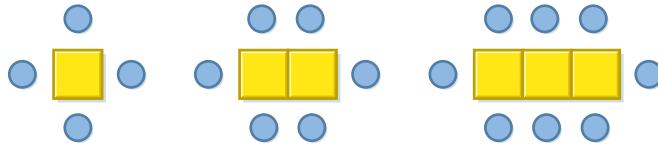
 **How many people can be seated around a table made by joining 10 square tables in a row?**





Rebecca's Model

I'll use square tiles and counters to model the problem.



Then I'll create a number table using my model.

I'll look for a pattern in the number table.

Seating for Dinner

Number of tables	1	2	3	4
Number of people	4	6	8	

pattern rule

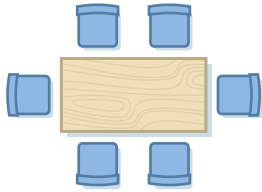
A description of how a pattern starts and how it continues

For example, for the pattern 6, 18, 30, 42, ..., the pattern rule is "Start at 6 and add 12 each time."

- A. Model 4 square tables joined in a row. How many people can be seated around the large table?
- B. What is the **pattern rule**?
- C. Predict how many people can be seated when 6 square tables are joined in a row. Make a model to check.
- D. Extend the pattern for up to 10 square tables. How many people can be seated around the largest table?

Reflecting

- E. How did Rebecca use her model to create a number table?
- F. How did you extend the pattern to solve the problem?

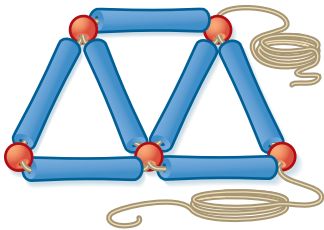
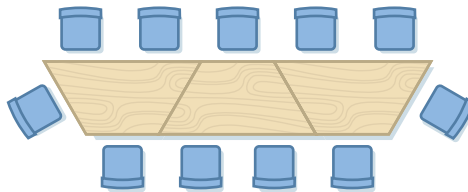


Checking

- Jay found longer tables to use for the dinner. These tables can seat 2 people at each side and 1 person at each end.
 - How many people can be seated at 2 of these longer tables joined in a row? Use a sketch or a model.
 - How many people can be seated at 10 of these longer tables joined in a row?
 - What is the pattern rule for the number of people who can be seated at these tables?

Practising

- The table below is formed by joining 3 smaller tables. How many of the smaller tables are needed to seat 26 people?



- Savannah is making a bracelet using long blue beads, round red beads, and string. Make a model of Savannah's design. How many triangles will be in Savannah's bracelet if she has the following materials?
 - 15 blue beads
 - 12 red beads
- David and Jamal used triangles to make designs on their bookmarks. They each used 24 identical triangles. David arranged the triangles in rows of 3, and Jamal arranged them in rows of 4.
 - Sketch a model of each student's design.
 - Write a pattern rule for the number of triangles in each student's design.
 - How many rows does each student have in his design? How do you know?



- How can a model be used to predict the number of choir singers in row 8 of the pattern at the left?