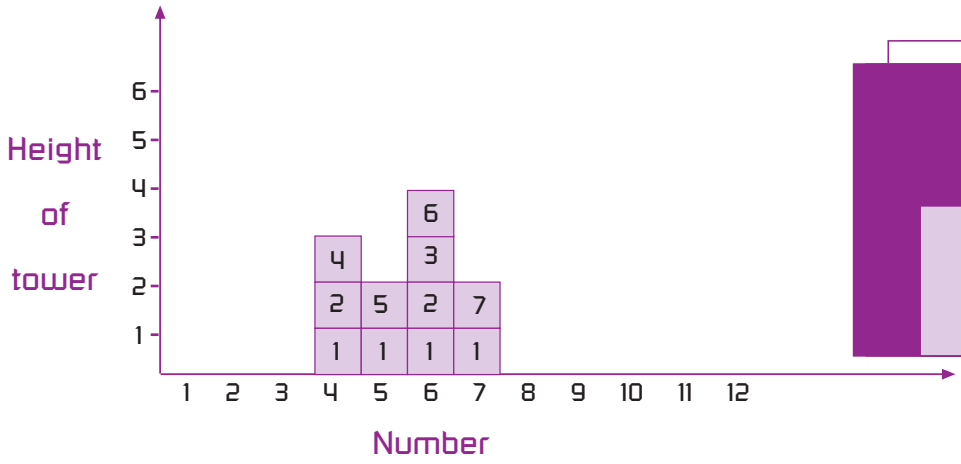
# Factor Towers

You need: square grid paper

ACTIVITY

Below is part of a factor tower city.
Each tower lists all the factors of its number in separate blocks.




The factor tower shows that 5 has two factors, 1 and 5, and 6 has four factors, 1, 2, 3, and 6.

1. On square grid paper, draw a factor tower city for all the numbers up to 25.

2. **a.** List all the numbers up to 25 with two factors only.
   **b.** Make lists of numbers that have only three factors, four factors, and so on.

3. **a.** Describe the types of numbers or any patterns you see in each list.
   **b.** Describe any other patterns that you notice.

INVESTIGATION

There is an interesting pattern for the squares of the first three triangular numbers:

| Triangular number | Addends | Square of triangular number | Sum of the cubes of the addends of the triangular number |
|---|---|---|---|
| 1 | | $1^2 = 1$ | $1^3 = 1$ |
| 3 | 1 + 2 | $3^2 = 9$ | $1^3 + 2^3 = 9$ |
| 6 | 1 + 2 + 3 | $6^2 = 36$ | $1^3 + 2^3 + 3^3 = 36$ |

Investigate whether this pattern holds for other triangular numbers.