

Investigations – Possible Hypotheses

Investigation 1

The n -th triangle number is $\frac{n(n+1)}{2}$ or $\frac{1}{2}n^2 + \frac{1}{2}n$.

Investigation 2

If there are n people in the room, then the number of handshakes is $\frac{n(n-1)}{2}$ or $\frac{1}{2}n^2 - \frac{1}{2}n$.

Investigation 3

If a convex polygon has n sides, then the number of diagonals is $\frac{n(n-3)}{2}$ or $\frac{1}{2}n^2 - \frac{3}{2}n$.

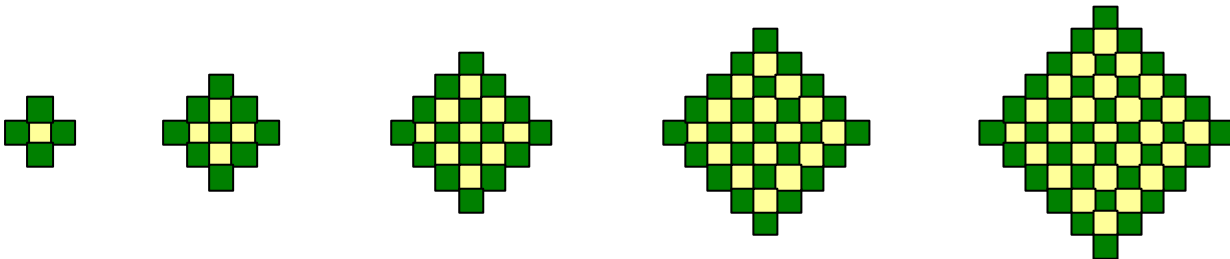
Investigation 4

If a circle is divided into the maximum number of pieces by n straight lines, then the number of pieces is $\frac{1}{2}(n^2 + n + 2)$.

Investigation 5

If the house of cards has n rows, then the number of cards is $\frac{n(3n+1)}{2}$ or $\frac{3}{2}n^2 + \frac{1}{2}n$.

Investigation 6



If the pattern is n tiles wide, then the total number of tiles is $\frac{n^2 + 1}{2}$.

Investigation 7

If the square-based pyramid has n layers, then the number of balls is $\frac{n(n+1)(2n+1)}{6}$ or $\frac{1}{3}n^3 + \frac{1}{2}n^2 + \frac{1}{6}n$.

Investigation 8

If the tetrahedron has n layers, then the number of balls is $\frac{n(n+1)(n+2)}{6}$ or $\frac{1}{6}n^3 + \frac{1}{2}n^2 + \frac{1}{3}n$.