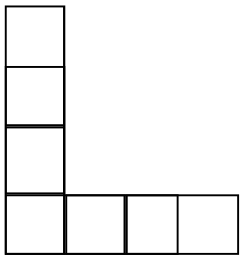
Maths Investigation

I started with the problem "L-Shapes". It looked like this: This L shape has height 4 and width 4. Work out (a) the perimeter (b) the number of squares and (c) the number of lines needed to draw an L shape with: height 25 and width 25



.height 100 and width 100

.height n and width n

Firstly I wrote some formulae based on the 4x4 L-shape.

P (perimeter) = h+w+(h-1)+(w-1)+2 this can be simplified to 2h+2w
NoS (Number of Squares) = h+(w-1)
NoL (Number of Lines) = (3(h-1))+(3(w-1))+4 or (3h)+(3w)-2

Next I wrote out what the 25x25 formulae would look like:

P=(2x25)+(2x25)=100
NoS=25+(25-1)=49
NoL=(3(25-1))+(3(25-1))+4=148 or (3x25)+(3x25)-2=148

I then wrote the same for 100x100:

P=(2x100)+(2x100)=400
NoS=100+(100-1)=199
NoL=(3(100-1))+(3(100-1))+4=598 or (3x100)+(3x100)-2=598

I checked my results by drawing out the shapes. My answers were all correct.

I can put the results in a table to work out height n and width n:

Starting Number	Perimeter	Number of Squares	Number of Lines
25	100	49	148
100	400	199	598
n	4n	2n-1	6n-2