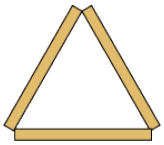
Sticky Triangles

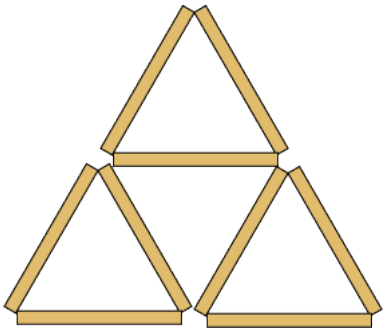
I was exploring a puzzle in which headless match sticks had to be moved to make a different number of triangles.

I made one small triangle



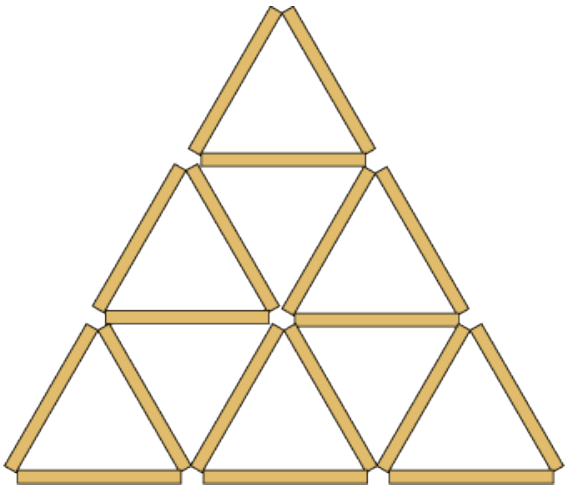
3 matches

I made it into 4 small triangles by adding 6 matches.



9 matches

I added another row and counted the number of small triangles and counted the matches.



I made a table of my results and continued adding rows. I found many patterns.

Have a go and see what patterns you can find. You do not have to use match sticks (or cocktail sticks) - drawing lines will do just as well.

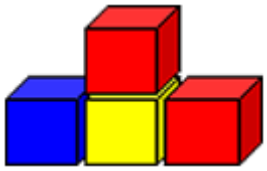
Find a good way to record your results. See if you can predict the numbers for rows of triangles you have not drawn.

When you have done all you can with triangles, see if you get the same sort of results with squares. Then think of other shapes which might make number patterns as they grow.

Up and Down Staircases

One block is needed to make an up-and-down staircase, with one step up and one step down.

4 blocks make an up-and-down staircase with 2 steps up and 2 steps down.



How many blocks would be needed to build an up-and-down staircase with 5 steps up and 5 steps down?

Explain how you would work out the number of blocks needed to build a staircase with any number of steps.