Investigating number patterns

Dear teachers and parents,

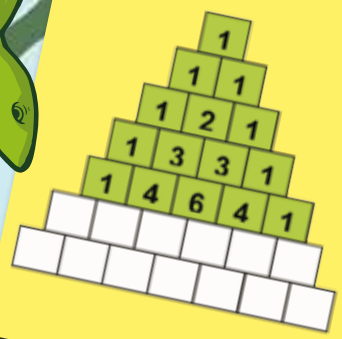
This week our game is aimed at the Intermediate Phase. The focus is on number patterns. We need to encourage children to look for patterns. Some patterns are very simple while others are extremely complex. Children need to be encouraged to look for the differences between the numbers in the sequence. Once they have discovered the rule, they need to use this information to figure out what comes next. Begin by working through the examples below and then play the game.

Here are some examples of number patterns:

- 3; 6; 9; 12;.....adding on 3
- 5; 6; 11; 17.....adding on the previous number
- 1; 4; 9; 16; 25.....square numbers (1 x 1); (2 x 2); (3 x 3) and so on
- 12; 24; 48; 96....doubling

This is a different type of pattern known as Pascal's triangle:

Each number in the triangle is the sum of the pair of numbers directly above it. The first four rows are as follows (the 1 at the top is considered to be Row 0). It is named after the French mathematician Blaise Pascal (1623 - 1662).



- Look at the diagram. What patterns can you see?
- Complete the next two rows.
- Look at the diagonal lines on the triangle. What patterns do you notice?
- Is there a way of predicting the next line of the triangle, without having to work out each number by adding the two numbers above it? How?
- Work out the totals of each horizontal row. Is there a pattern? Can you predict the next two totals?

Number track 3

Number track 4

FINISH

START

Number track 1

Number track 2

Another famous pattern is the Fibonacci sequence:

1; 1; 2; 3; 5; 8; 13; 21; 34; 55; 89; 144; 233 ... (1+1=2; 1+2=3; 2+3=5...etc)

The first two Fibonacci numbers are 0 and 1, and each remaining number is the sum of the previous two. Some people leave out the initial 0, instead beginning the sequence with two 1s. The Fibonacci sequence is named after Leonardo of Pisa, who was known as Fibonacci.

Can you crack these codes?

Try and find the pattern and then continue it:

a) 14; 20; 26; 32, __, __, __
b) 49; 46; 43; 40 __, __, __
c) 13; 26; 39; __, __, __
d) 5; 10; 20; __, __, __
e) 1, 2, 4, 8, __, __, __

Up the tree
A game suitable for 2- 4 players

How to play:

- Each player can select a branch of the tree. They each have a turn to come up with their own sequence.
- They begin by writing down the first three numbers of the sequence on their number track, for example:

7	10	14					

- Players then place their counters (stones, buttons etc) at the bottom of the tree trunk.
- They throw the dice and move the correct number of spaces.
- If they land on a yellow block, they may fill in the next number in their sequence.
- If they land on green block, they have to miss a turn.
- If they land on a red block, they have to fill in two blocks of the sequence.
- The first player to complete their number track correctly is the winner.