# Odds, Evens and More Evens

Here are the first few sequences from a family of related sequences:

$A_0$ = 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, …
$A_1$ = 2, 6, 10, 14, 18, 22, 26, 30, 34, …
$A_2$ = 4, 12, 20, 28, 36, 44, 52, …
$A_3$ = 8, 24, 40, 56, 72, …
$A_4$ = 16, 48, 80, …
$A_5$ = 32, 96, …
$A_6$ = 64, …

**Alison started by thinking:**

"I have noticed that each number is double the number in the row above.

I wonder if I can work out what would go in the rows above 1000?"

**Bernard started by thinking:**

"I have noticed that in A1, the numbers which end in a 0 are 10, 30, 50...

If I carry on going up in 20s I won't hit 1000, so I know 1000 isn't in A1."

**Charlie started by thinking:**

"I have noticed that each number in A1 is 2 more than a multiple of 4.
I know 1000 is 250 x 4 so it can't be in A1."

**Can you use each of their starting ideas to answer the question "Which sequences will contain the number 1000?"**