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, …

Which sequences will contain the number 1000?

Here are some further questions to consider:

How many of the numbers from 1 to 63 appear in the first sequence? The second sequence? ...

Do all positive whole numbers appear in a sequence?

Do any numbers appear more than once?

Which sequence will be the longest?

Given any number, how can you work out in which sequence it belongs?