

As outcomes, Year 8 pupils should, for example:

Generate sequences from practical contexts.

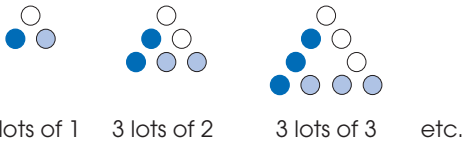
- Find the first few terms of the sequence; describe how it continues using a term-to-term rule.
- Describe the general (nth) term, and justify the generalisation by referring to the context.
- When appropriate, compare different ways of arriving at the generalisation.

For example:

- Growing triangles

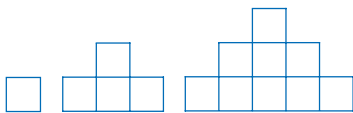


This generates the sequence: 3, 6, 9...
Possible explanations:
We add three each time because we add one more dot to each side of the triangle to make the next triangle.
It's the 3 times table because we get...



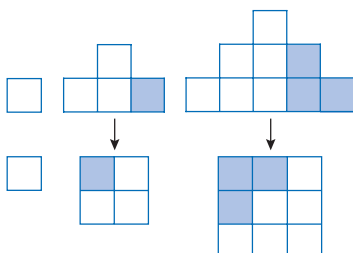
The general (nth) term is $3 \times n$ or $3n$.
Possible justification:
This follows because the 10th term would be '3 lots of 10'.

- 'Pyramid' of squares



This generates the sequence: 1, 4, 9, ...
Possible explanation:
The next 'pyramid' has another layer, each time increasing by the next odd number 3, 5, 7, ...

The general (nth) term is $n \times n$ or n^2 .
Possible justification:
The pattern gives square numbers. Each 'pyramid' can be rearranged into a square pattern, as here:



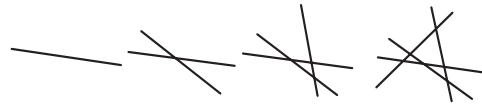
As outcomes, Year 9 pupils should, for example:

Generate sequences from practical contexts.

- Find the first few terms of the sequence; describe how it continues using a term-to-term rule.
- Use algebraic expressions to describe the nth term, justifying them by referring to the context.
- When appropriate, compare different ways of arriving at the generalisation.

For example:

- Maximum crossings for a given number of lines

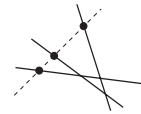


Number of lines	1	2	3	4	...
Maximum crossings	0	1	3	6	...

Predict how the sequence might continue and test for several more terms.

Discuss and follow an explanation, such as:

A new line must cross all existing lines.

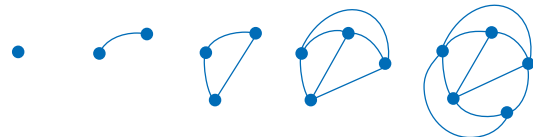


So when a new line is added, the number of extra crossings will equal the existing number of lines, e.g. when there is one line, an extra line adds one crossing, when there are two lines, an extra line adds two crossings, and so on.

No. of lines	1	2	3	4	5	...
Max. crossings	0	1	3	6	10	...
Increase		1	2	3	4	...

- Joining points to every other point

Joins may be curved or straight. Keeping to the rule that lines are not allowed to cross, what is the maximum number of joins that can be made?



No. of points	1	2	3	4	5	...
Maximum joins	0	1	3	6	9	...

Predict how the sequence might continue, try to draw it, discuss and provide an explanation.