

## Zoya

I think Zoya is counting the smaller rectangles that make up one big rectangle as well as counting the big rectangles separately. Zoya needs to choose whether she is counting the bigger rectangles or the smaller rectangles and then only count that type of rectangle to get the answer of how many rectangles there are.

## Max

Max is counting all the rectangles he can see. He needs to count only the small rectangles instead of every group of them and the small ones. He should keep the size of the counting stick the same the whole time and just count the big or small rectangles but not both types.

## Method for finding how many rectangles there are on a stick with 100 sections

To find how many rectangles there are on a stick with 100 sections you need to find the 100<sup>th</sup> term. To do this you make the Nth term. The nth term is how far into a sequence you are for example if you had the sequence 2 4 6 8 10 you would find the Nth term by putting it in a table like this:

N	1	2	3	4	5	6
Term	1	3	5	7	9	?

To find what the next number in the sequence is you could count on but with larger sequences this can get hard. Instead, you could work out the difference between the first and second term which in this case is 2 then you multiply it by the n of the larger term which means we have done the equation  $2 \times 2$ . Next you find the answer to that question which is 4 and see what you must do to that answer to get the second number in the pair. In this case you must subtract 1. this is your calculation now:  $2 \times 2 - 1 = 3$ . This is your rule for this sequence

$T=2xn-1$ . So, if N is 100 then  $2 \times 100$  is 200-1 is 199 so the 100<sup>th</sup> term for this sequence is 199. This method also works for the counting stick problem:

N	1	2	3	4	5	6	7	8	9	10
Term	2	4	6	8	10	12	14	16	18	20

$T=2xn$  so the 100<sup>th</sup> term for the stick problem is 200 and the 1000<sup>th</sup> term is 2000