Patterning 2

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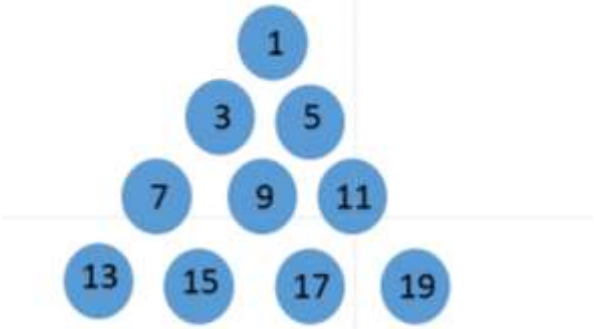
Looking for patterns is a fundamental aspect of mathematics particularly in generalising number and algebra.
Consider the odd numbers set out in a triangular pattern, as illustrated below and address the two questions posed.



1. What is the sum of the numbers in the 10th row,
2. What are the 10 numbers in the middle of the 100th row?

So, where do you start?

a. Make a table with heading to address the questions being asked:

Row number	How many numbers are in the row	Number in the middle	Sum of the row
1	1	1	1
2	2	4	8
3	3	9	27
4	4	16	64
5	5	25	125
6	6	36	216

b. What do you notice from the completed table?
c. What patterns can you see? List them, experiment with what you have in the table.
d. Can you now generalise?

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1	1	1	1
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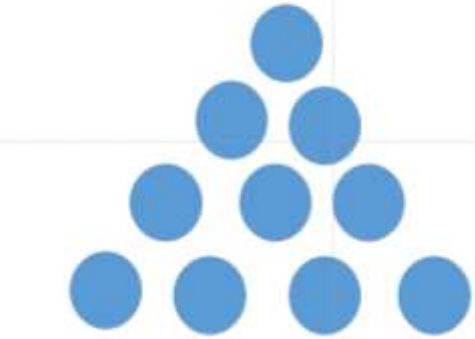
5	5	25	125
6	6	36	216
…	…	…	…
n	n	n^2	n^3

Now, let's generalise further:
What other geralisations can to make now?
e.g.
How many numbers are in the middle × Number in the middle

Can we do something similar with even numbers?



Make a table with heading to address the questions being asked:

Row number	How many numbers are in the row	Number in the middle	Sum of the row
1			
2			
3			
4			
5			
6			

What do you notice from the completed table?
What patterns can you see? List them, experiment with what you have in the table.
Can you now generalise?

Row number	How many numbers are in the middle	Number in the middle	Sum of the row
1			
2			
3			
4			
5			
6			
…	…	…	…
n			

What other geralisations can to make?