

Arrangement of rectangles



no. of rectangles

1

3

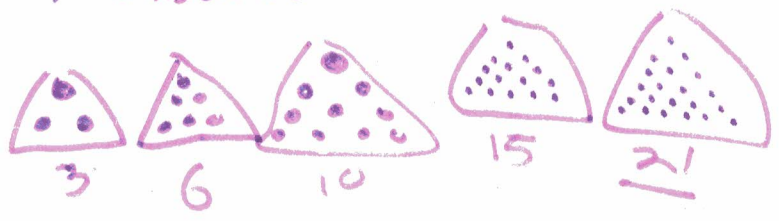
6

10

15

I predict that the next number is 21.

These numbers are all TRIANGULAR NUMBERS!



$$\begin{aligned}
 2 & 1+2=3 \\
 3 & 1+2+3=6 \\
 4 & 1+2+3+4=10 \\
 5 & 1+2+3+4+5=15 \\
 6 & 1+2+3+4+5+6=21
 \end{aligned}$$

$$1+2+3+4 \dots + (n-3) + (n-2) + (n-1) + n$$

1	2	3	4
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$(n-1)$	$(n-2)$	$(n-3)$	
$(n+1)$	$(n+1)$	$(n+1)$	$(n+1)$

These are $n \div 2$ items

The sum of the series is (triangle number)
equal to $(n+1) \times (n \div 2)$

$$= (n+1) \times \frac{n}{2}$$

$n=100$ triangular no is $(100+1) \times (\frac{100}{2})$

$n=1000$ triangular no is $(1000+1) \times (\frac{1000}{2}) = 505000$

$$\begin{aligned}
 &= 1001 \times 500 \\
 &= 500500
 \end{aligned}$$