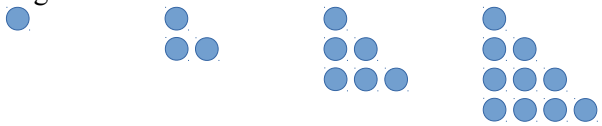
Triangular Square and Cube Numbers

The first four triangular numbers are:



$T_1 = 1$ $T_2 = 3$ $T_3 = 6$ $T_4 = 10$

1) (a) List the first 10 triangular numbers, T_1 to T_{10}
(b) List the first 10 square numbers, S_1 to S_{10}
(c) List the first 5 cube numbers, C_1 to C_5

2) (a) Calculate: (i) $T_1 + T_2$ (ii) $T_2 + T_3$ (iii) $T_3 + T_4$ (iv) $T_4 + T_5$
(b) Can you spot a pattern? Write down a rule: "$T_{n-1} + T_n =$ ___"
(c) Draw a diagram of dots to explain why the rule works.

3) (a) Calculate (i) $8T_1 + 1$ (ii) $8T_2 + 1$ (iii) $8T_3 + 1$ (iv) $8T_4 + 1$
(b) Write down a rule based on the pattern you spot here.
(c) Can you draw a diagram of dots to explain why this rule works?

4) (a) Calculate: (i) $C_1 + C_2$ (ii) $C_1 + C_2 + C_3$ (iii) $C_1 + C_2 + C_3 + C_4$
(b) Can you spot a pattern? Write down a rule:
"The sum of the first n cube numbers is the ..."

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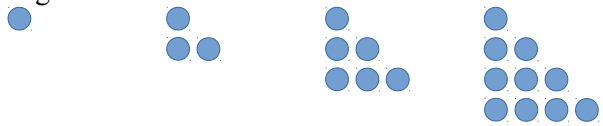

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(b) Write down a rule based on the pattern you spot here.
(c) Can you draw a diagram of dots to explain why this rule works?

4) (a) Calculate: (i) $C_1 + C_2$ (ii) $C_1 + C_2 + C_3$ (iii) $C_1 + C_2 + C_3 + C_4$
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"The sum of the first n cube numbers is the ..."