Build each pattern with your cubes before you answer. Leave patterns 1 to 3 standing while you work.

1 A pattern is made of rows of 2 cubes, with 1 extra cube on the end. Pattern 1 has 3 cubes, pattern 2 has 5, pattern 3 has 7.

(a) How many cubes in pattern 4? (1)

(b) Write down the nth term (1)

(c) Which cube is the $+1$? (2)

(4 marks)

2 A pattern is made of rows of 4 cubes, with 3 extra cubes that are in every pattern. Pattern 1 has 7 cubes, pattern 2 has 11, pattern 3 has 15.

(a) How many cubes in pattern 5? (1)

(b) Write down the nth term (1)

(c) Which cubes are the $4n$, and which are the 3? (2)

(4 marks)

3 A pattern is made of a single row of cubes as long as the pattern number, with 5 cubes underneath the first one. Pattern 1 has 6 cubes, pattern 2 has 7, pattern 3 has 8.

(a) How many cubes in pattern 10? (1)

(b) Write down the nth term (1)

(c) Explain why the rule has no number in front of the n (2)

(4 marks)

4 For each rule below, describe what the pattern would look like.

(a) $3n$ (2)

(b) $n + 4$ (2)

(c) $5n + 2$ (2)

(6 marks)

5 A pattern has nth term $6n + 1$.

(a) Build patterns 1 and 2. How many cubes in each? (1)

(b) How many cubes in pattern 9? (1)

(c) Which single cube is in every pattern you built? (2)

(4 marks)