Puzzle of the Week
Stick Areas

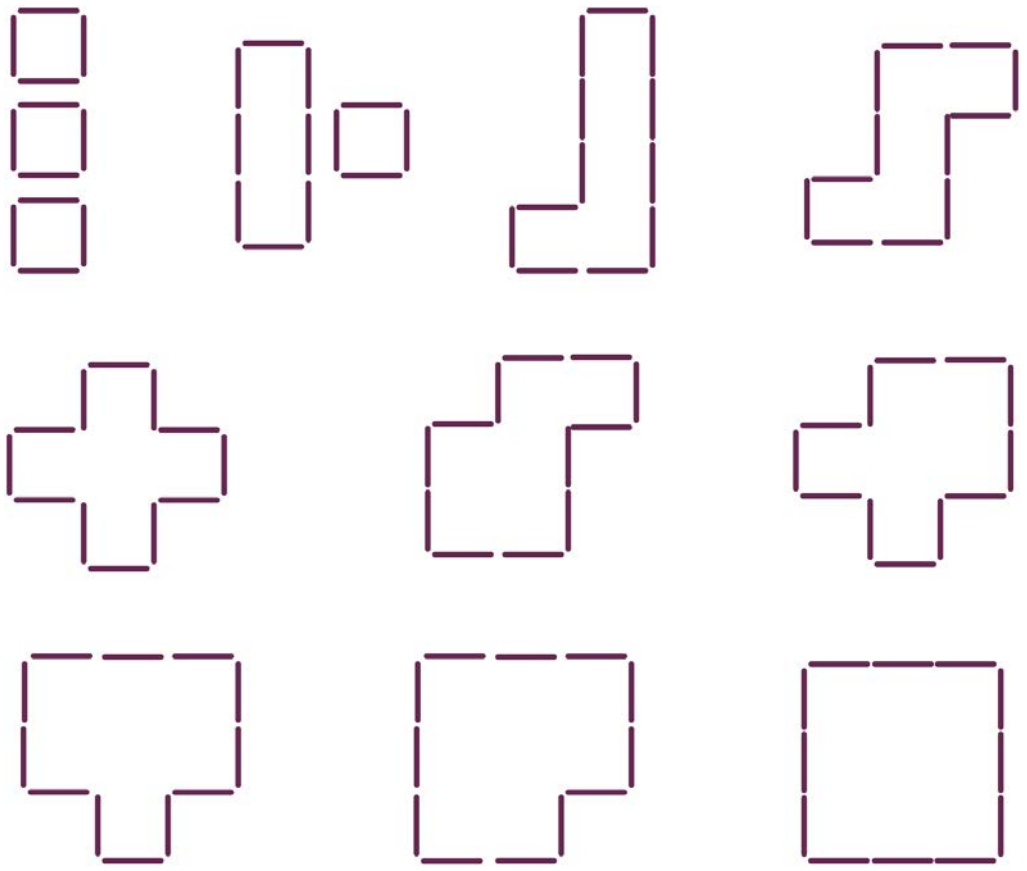
Suppose you have 12 sticks to use to enclose a region with horizontal and vertical sides. These three possible ways for doing that enclose areas of size 3, 5, and 9.

THE CHALLENGE: Find all the possible areas that you can create with 12 sticks.

EXPLORATION: What happens when you change the number of sticks? Are there some numbers of sticks that don't work at all?

Puzzle of the Week
Stick Areas – Notes

THE CHALLENGE: Here are some examples for creating areas from 3 to 9.



EXPLORATION: The sticks can always be paired up, so only even numbers of sticks will work. For the even numbers, two kinds of things can happen.

Multiples of 4: These numbers will behave just as 12 did. For a number of the form 4n, the smallest area will be produced by n 1 by 1 squares, and the largest by an n by n square.

Multiples of 4 plus 2: These numbers will be similar to a multiple of four, only they will have an extra bump. For a number of the form 4n + 2, the smallest area will be produced by (n - 1) 1 by 1 squares plus one 2 by 1 rectangle. The largest area will be an n by (n + 1) rectangle.