Workshop 1 Question Sheet

Question 1: Coastlines

On the next page is a very simple outline of the UK's coastline. We want to examine the different ways that the length of the coastline can be measured, and whether or not these methods can be trusted.

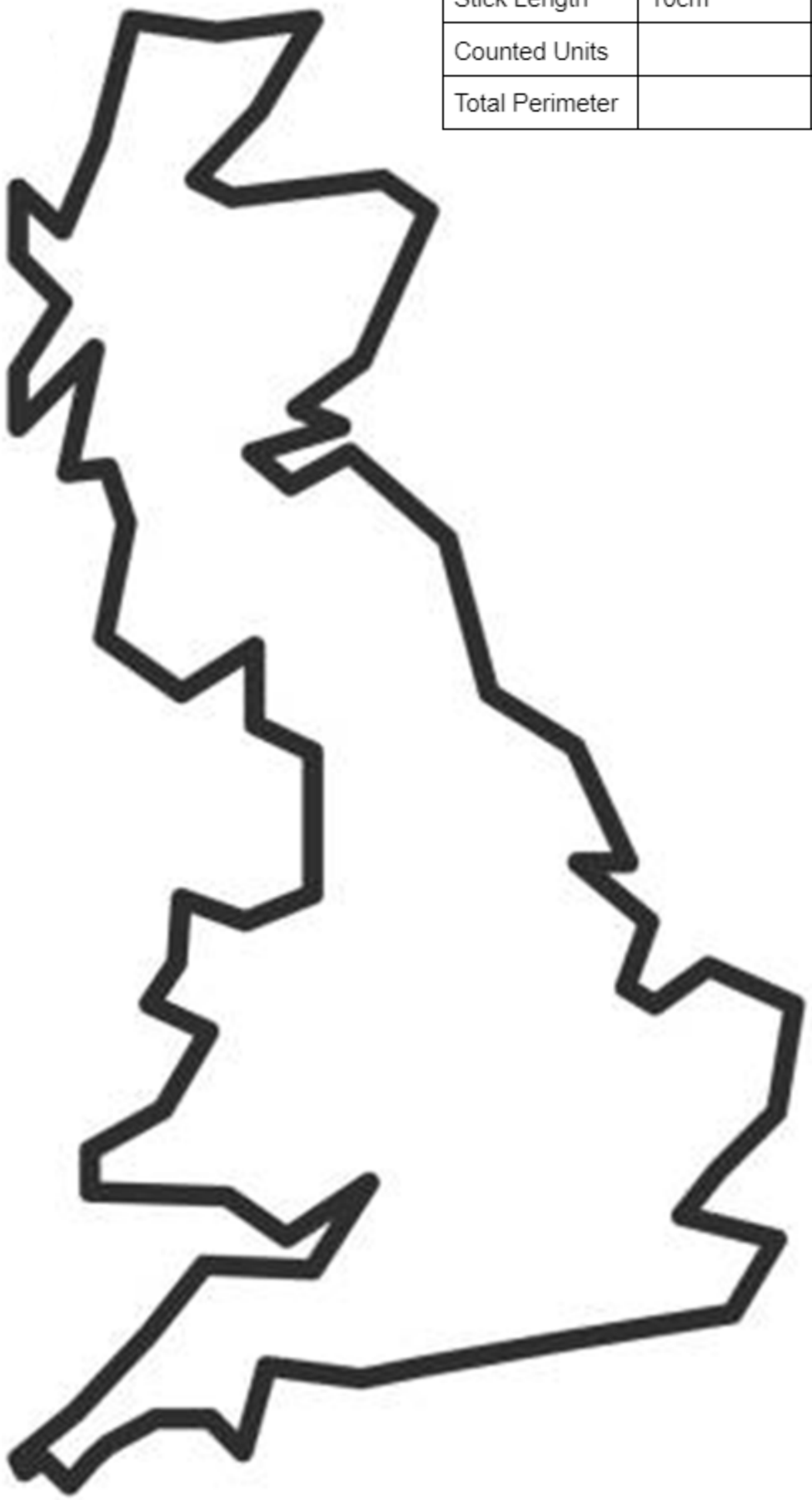
You will be provided with a strip paper, with two sides of length 2.5cm and two of length 10cm. Use these strips to measure the coastline. This will help you to calculate the total perimeter of the UK!

For example, here we have used 10 red sticks (it doesn't matter if you overestimate!)

a) Fill in the table on the next page - for the 5cm column, fold the strip you have in half along the longest side.

Important: you should not be mixing different lengths of sticks to measure the coastline. The aim is to calculate the length of the coastline using sticks of the same length!

Stick Length	10cm	5cm	2.5cm
Counted Units			
Total Perimeter			

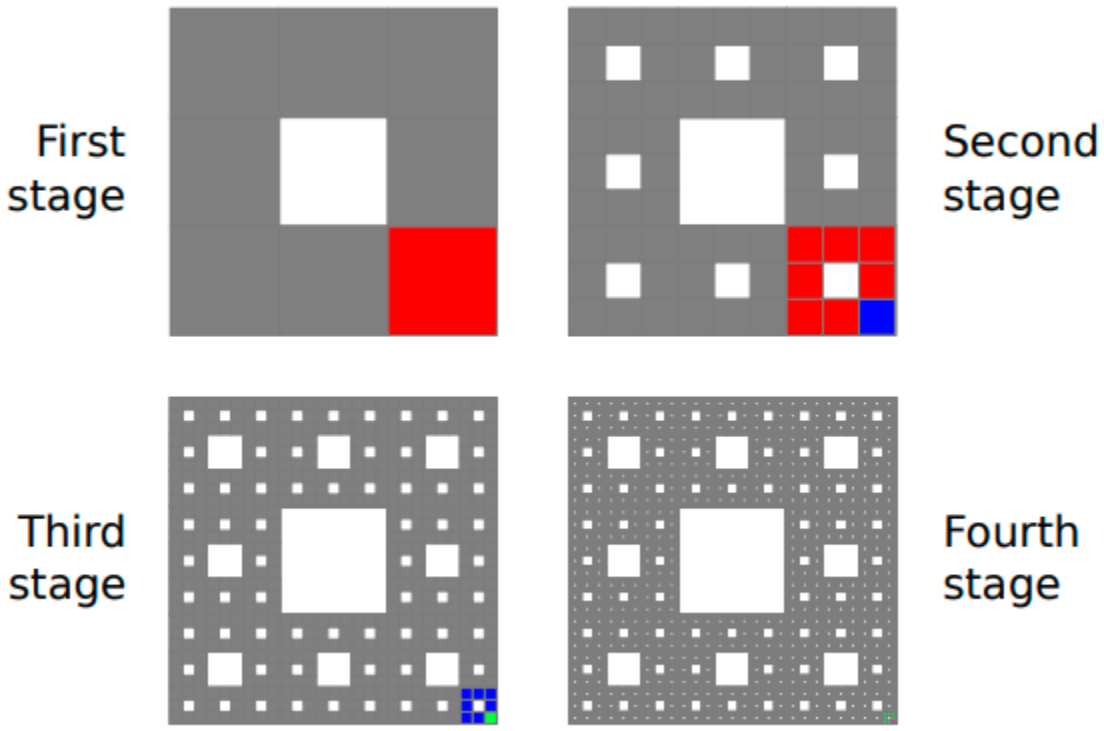


b) How does your answer change when shorter sticks are used?

c) Why do you think that is?

Question 2: Sierpinski Carpet

The Sierpinski Carpet is a well-known example of a fractal. It is made by dividing a square into 9 smaller squares, and removing the central square. This process is repeated for each of the 8 squares that are left over, as shown in the diagram:



a) What is the fraction of the area of the whole square that remains, after completing the second stage?

b) Find a general formula for the fraction of the area left over after completing the n^{th} stage.

Extension Question:

If you have completed the questions above, try to create your own fractal!

Remember the features we have just learnt about:

- It must be self-similar
- It must have fine detail (not a straight line)

Use the grid on the next page to experiment with some ideas!