Building patterns II

This task is about continuing a 3-D spatial pattern.

Step 1

Step 2

Step 3

The faces of Step 2 are shown below.

3 blue faces on the back

3 blue faces on the front

8 white faces:
- 4 shown.
- 4 not shown (2 on the left side and 2 on the bottom).
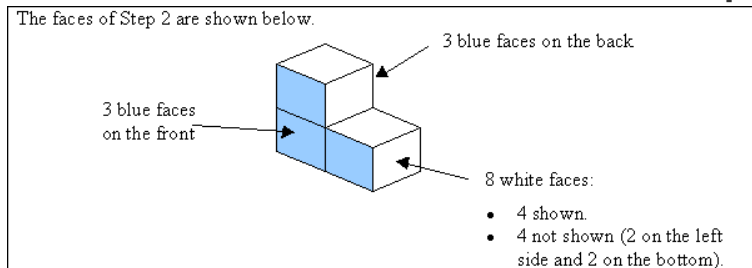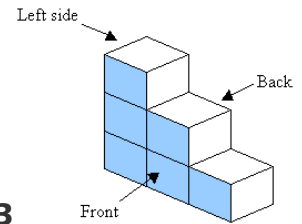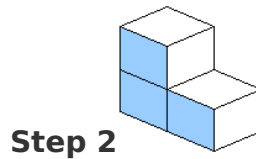
Here are the first three models of a sequence of steps.
Each model has the faces on the front and back painted blue and all the other faces painted white.

a) Use cubes to build the next 2 models in the sequence, i.e., Step 4 and Step 5.

b) Use the models to complete the table for Steps 4 and 5 only in the table below.
   The first three steps have been done for you.

Step number (n)	1	2	3	4	5	6	7
Number of white (other) faces (w)	4	8	12				
Number of blue (side) faces (b)	2	6	12				

> **Check with your teacher if your models and table are correctly completed for Steps 4 and 5 before continuing with parts c) to e).**

c) Without using the cubes, complete the table above for Steps 6 and 7.

d) i) In Step 10 how many faces would be white? _____
   ii) Explain in words how to work out the number of white faces in Step 20.

   _____

   iii) Complete this equation for the number of white faces (w) in Step number *n*.

   $w =$ _____

e) i) How many blue faces would there be in Step 10? _____
   ii) Complete this equation for the number of blue faces (b) in Step number *n*.

   $b =$ _____