

PATTERN WALLS & FUNCTIONS

Materials: Each group of 4 will need 125 cubes in 2 colors.

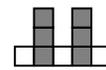
Show students this pattern wall & have them use any 2 color cubes to make it. Say:

1. **The wall with one tower takes five cubes to build.** Show the students how to record using a table.



Towers	Total No. of Cubes
1	5

2. Have students add to the wall like this. Say, **the wall with two towers takes nine cubes to build.**



Towers	Total No. of Cubes
1	5
2	9

3. Add to the wall again. Say, **The wall with three towers takes 13 cubes to build.**



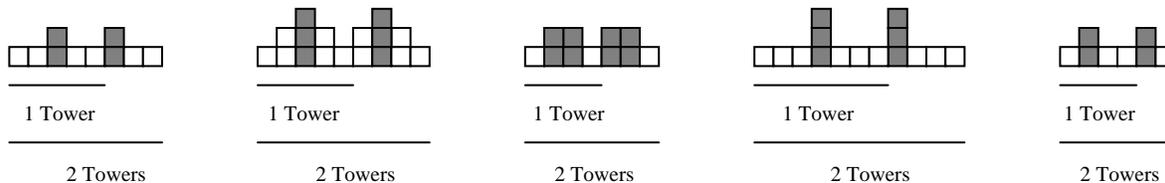
Towers	Total No. of Cubes
1	5
2	9
3	13

4. Have the students continue the wall with the same pattern. Challenge them to find the total number of cubes in the wall when there are 50 towers, without building the 50 towers. Allow 5 to 10 minutes for exploration.
5. Investigate the pattern together. Ask students what they have discovered & whether anyone has a rule that describes the pattern. If no one has discovered the rule or pattern, guide them through finding the pattern in the table & linking it to the visual (i.e., seeing the rule in the cubes.) Ask what the 4, n, and 1 represent in the rule. Explain if no one sees the connection. Show the additional examples which have the rule $4n + 1$ where:

n is the number of towers in the wall
4 is the number of cubes in each segment
+1 is the very first block

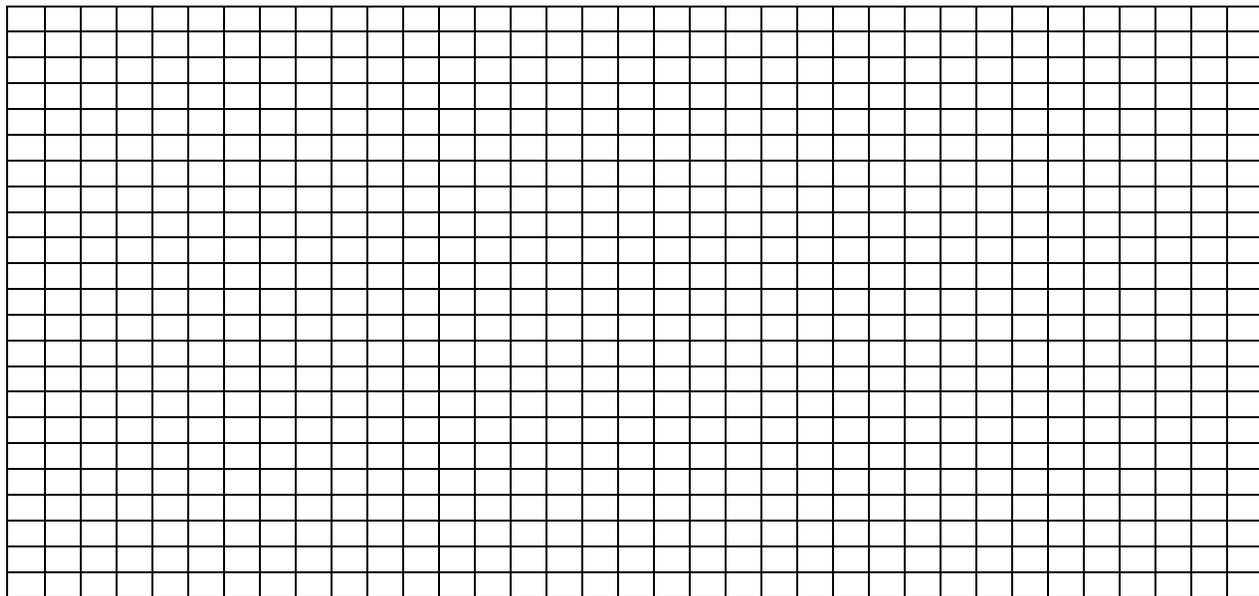
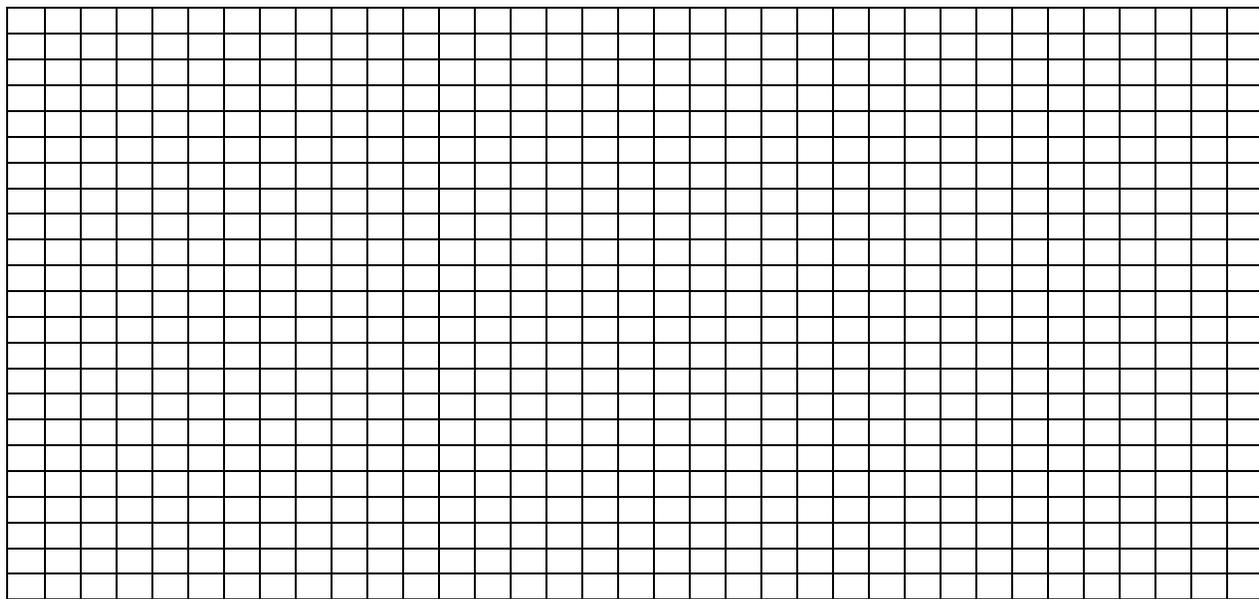


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- Display the walls above. Tell the students to choose one of the walls and build it, create a table & write the rule in words & as a function rule. Use the rule to determine the number of cubes for 50 towers (Solutions from left to right: $4n + 2$, $8n + 1$, $5n + 1$, $6n + 3$, $4n$)
- Close the lesson by having student report their results. Examine with them how the visual for $4n$ was different than the others.

[Adapted from: Connections-Linking Manipulatives to Mathematics-Grade 7, Creative Publications]



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