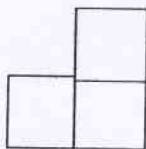


Toothpick Staircase

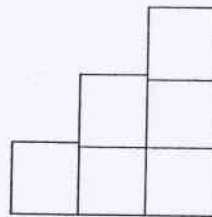
Suppose the staircase figures shown below are made with toothpicks.



Staircase 1



Staircase 2



Staircase 3

Answer the following questions on a separate sheet of paper.

1. Draw or build staircase 4 and staircase 5.
2. What patterns in the set of staircases do you notice?
3. "Perimeter toothpicks" are those toothpicks that go around the outside of each staircase. How many perimeter toothpicks would there be in staircase 10?
4. Write a rule for knowing the number of perimeter toothpicks for any staircase. Explain why your rule works.
5. What staircase has 72 "perimeter toothpicks"? Show how you found your answer.
6. How many *total* toothpicks do you need to make staircase 10?
7. Write a rule for knowing the total number of toothpicks for any staircase. Explain why your rule works.
8. Is it possible for a figure to have 275 toothpicks? Explain.