The following diagrams represent the first four stages of a pattern. How many small squares are in the 5th stage? The 10th stage? Any stage?

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**Student Solutions to Staircase Problem**

Ms. Chen’s students produced the following seven answers.

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| Student A  NEXT = NOW + Stage # I noticed that if you add the stage number to the current value you get the next value. |
| Student B  I noticed that with the even numbered terms, you can multiply the term number times half the term number and then add, again, half the term number. Ex: 4\*2 + 2 |
| Student C  Build a square to complete each staircase, so, for example, stage 4 becomes a 4 x 4 square. The total number of tiles should be divided by 2 because I have twice as much as the original. |
| Student D  , *n* represents the stage number |
| Student E  Build stage 4 two times. Notice that the two stairs can be pushed together to form a rectangle. That still has four tiles across the base and five tiles up the side. Take the total number of tiles should be divided by 2 because I have two of them. |
| Student F  Each value is just the term number times the next term number and divide that product by 2. |
| Student G  To find each value, just add the term numbers from 1 up to the term number. For example, for the 6th stair, just add 1 + 2 + 3 + 4 + 5 + 6. I noticed that combining 1 + 6, 2 + 5, and 3 + 4 each make 7, so a short way to solve that is (1 + 6) \* 3. The nth term would be (1+n) \* n/2. |