Grade 5 Chapter 1 Lesson 4
3-D Patterns

Answers

A. For example, with each new stack, Heather added a new bottom row. The bottom row of each new stack has two more cubes than the bottom row of the previous stack. You see this in the "Number of new boxes" column.

B.

Number of layers	Number of new boxes	Total number of boxes
4	7	9 + 7 = 16

Lesson 4 Answers (continued from p. 31)

C. For example, the number of new boxes for stack 6 will be 11. I know this because the number of new boxes goes up by 2 each time. Since I know stack 4 is 7 new boxes, then stack 6 will have $7 + 2 + 2 = 11$ new boxes. The total number of boxes will be 36 because I have to add 9, then 11. $16 + 9 + 11 = 36$.

D. For example, the numbers are 1, 4, 9, and 16. They go up by 3, 5, 7, 9. So the pattern rule is: start at 1, add 3, then 5, then 7. The number you add goes up by 2 each time.

E. For example, when the stack is 1 layer high, the total number of boxes is 1, when it is 2 layers high, the total number of boxes is $2 \times 2 = 4$. When the stack is 3 layers, the total number of boxes is 9, which is 3×3. The number of layers times itself will equal the number of boxes.

F. 10

1. For example, you can imagine the stack is growing if you think of it as the old stack with a new row added. This lets you record the number of new boxes just by looking at the new row. You can add the number of boxes in that row to the previous total number of boxes.

2. For example, you can look for connections between the columns. You can make the total number of boxes pattern from the number of layers pattern: all of the numbers in the number of layers column can be multiplied by themselves to make the total column.