**Checkerboard Squares Write-up**

**Problem Statement:** We need to find out how many squares there are in an 8 X 8 checkerboard?

**Process:** At first I thought it was easy. I counted the 1X1 squares and got 64. But then someone pointed to the second paragraph that mentioned 3X3 squares. And someone else mentioned the one big 8X8 square. And then I learned they could overlap.

So we started to count each size and found that there 4 7X7 squares (Hunter said to count the corners) and 49 2X2 squares and 36 3X 3 squares. We shared answers and wrote them in an In/Out chart on the board so we could see if there were any patterns.

Then Caroline and Max noticed a pattern: All the answers were squares in the opposite order (there were 1 • 1 8X8 square ; there were 2•2 7X 7 squares, etc.) so the whole list looked like this:

|  |  |  |
| --- | --- | --- |
| **Size of Square** | **Number of Squares** | **(Squared)** |
| One by one | 64 | (8X8) |
| Two by two | 49 | (7X7) |
| Three by three | 36 | (6X6) |
| Four by four | 25 | (5X5) |
| Five by five | 16 | (4X4) |
| Six by six | 9 | (3X3) |
| Seven by seven | 4 | (2X2) |
| Eight by eight | 1 | (1X1) |
| **Total Squares** | **204** |  |

So when we added them up (and checked our answers) we got 204 squares

**Solution:** 204 squares

**Extension:** How many squares in a 9X9 checkerboard? Or 10X10?

**Super Extension:** What is the formula for finding the number of squares in any size (an **X** by **X** ) checkerboard square?