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Mathematical Puzzles to Confound and Delight



MWW 5: SOLUTION

There are 34 ways to stack balls on top of a row of five balls (and so that there are no gaps between balls on any given row).

To see this, we could:

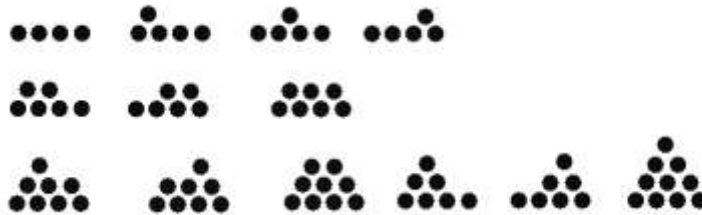
- Place no more balls on the row: 1 way
- Place 1 ball on the row: 4 ways
- Place each of the 2 diagrams with a row of two balls on top: $3 \times 2 = 6$ ways



- Place each of the 5 diagrams with a row of three balls on top: $2 \times 5 = 10$ ways.



- Place each of the 13 diagrams with a row of four balls on top: $1 \times 13 = 13$ ways.



This gives the $1 + 4 + 6 + 10 + 13 = 34$ ways.

For a row of six balls the count is $1 + 5 \times 1 + 4 \times 2 + 3 \times 5 + 2 \times 13 + 1 \times 34 = 89$.

Challenge: So far we have the sequence of answers 1, 2, 5, 13, 34, 89. Every second Fibonacci number?