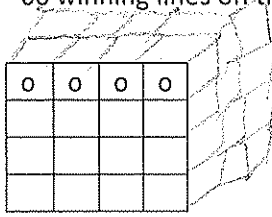


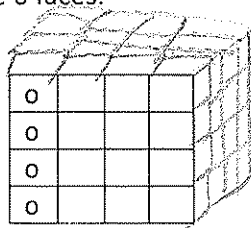
Marbles in a box <http://nrich.maths.org/895>

For a 4x4x4 cube, we would have:

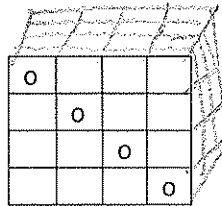
60 winning lines on the 6 faces:



$$6 \times 4 = 24$$

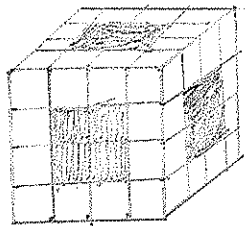


$$6 \times 4 = 24$$

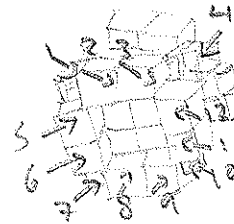
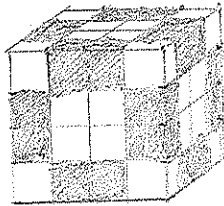


$$6 \times 2 = 12$$

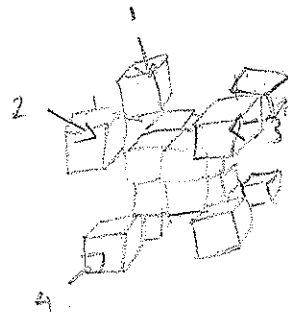
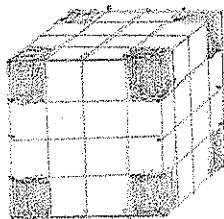
12 winning lines on the second layer:



12 winning lines on the second layer diagonals:



4 corner-to-corner winning lines:



Therefore in total there are  $60+12+12+4=88$  winning lines.