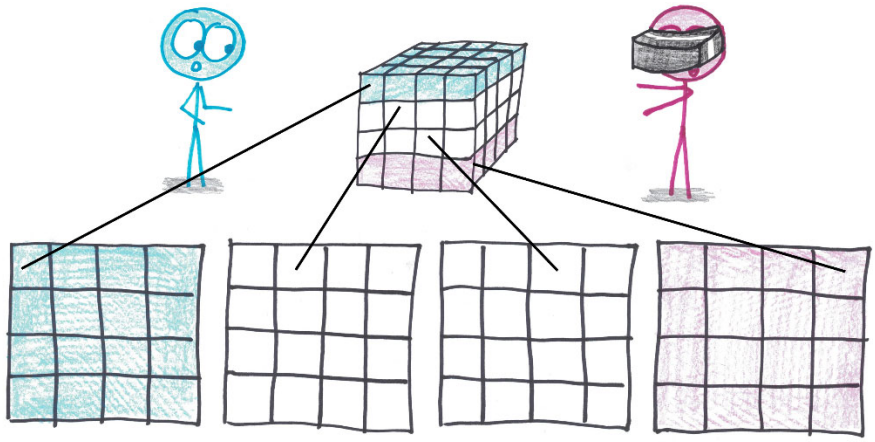
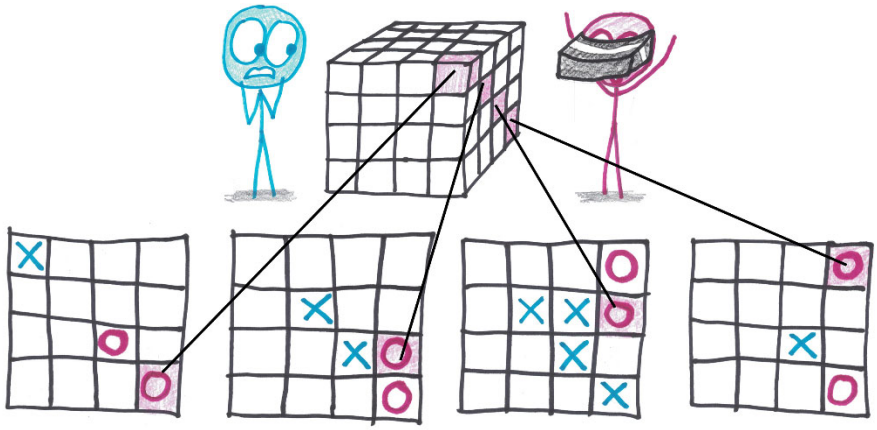
3D Tic-Tac-Toe

A Game of Length, Width, and Depth

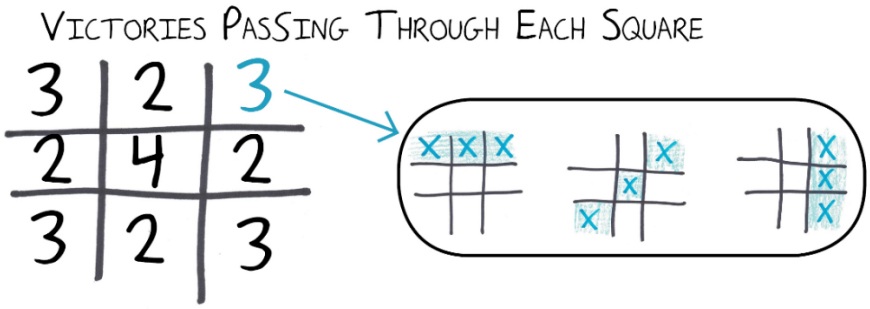
Unless you're reading this in a future filled with excellent VR technology—in which case, why do you people still read books?—it takes a bit of a hack to picture the third dimension. Instead of a 4-by-4-by-4 cube, **draw four 4-by-4 squares**, one to represent each layer of the game.



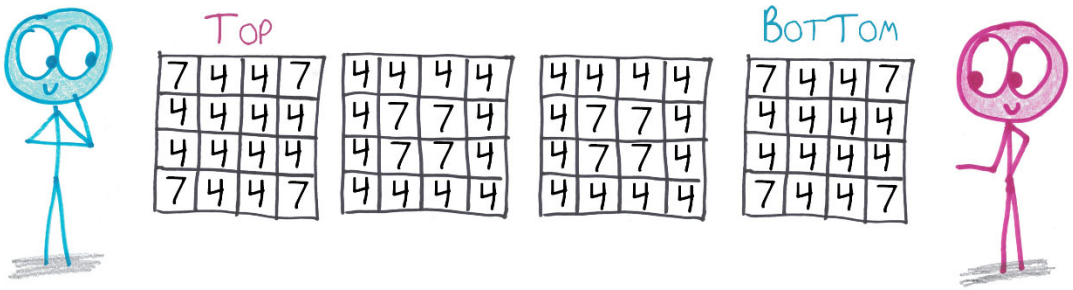
Take turns placing X's and O's. First to create four-in-a-row wins. Watch out for four-in-a-rows that slice across all the layers of the board; they're sometimes hard to spot until too late.



Which moves are best? Well, you can measure the value of a square by counting the possible victories that pass through it. Here's what that looks like for standard tic-tac-toe:



Apply the same method to the 3D game, an interesting pattern emerges: you want the corners of the extremal boards, or the centers of the central boards—but not vice versa.



There's a fun meta-game here: What other classics can you expand into the third dimension? Some, such as 3D Battleship, need little adjustment, just a careful choice of board size. Others, such as 3D chess, require more dramatic adjustment.[1] Others, such as 3D Dots and Boxes, are easy to formulate (you win a cube by drawing the twelfth edge) but hard to visualize (good luck drawing lines between layers!). And some games, such as 3D sprouts, stop working entirely (because in 3D, the lines no longer create separate regions, making the game as pointless and preordained as Brussels Sprouts).

[1] According to R. Wayne Schmittberger, commercial 3D chess sets "come with many different rules, most of which have one thing in common: They're very bad."