## Dots And Boxes

Dots and Boxes is a classic pen-and-paper game for two players. The game starts with an empty grid of dots. Usually the players take turns adding a single horizontal or vertical line between two unjoined adjacent dots. A player who completes the fourth side of a $1 \times 1$ box earns one point and takes another turn. (A point is typically recorded by placing a mark that identifies the player in the box, such as an initial.) The game ends when no more lines can be placed. The winner is the player with the most points.


While the game seems simple on the surface, there are many levels of strategy. Most novices play with basically playing random lines, and trying to avoid playing the third side to any box. (Which would give it to their opponent.)

More experienced players focus on the creation of chains. A chain is a group of two or more adjacent boxes in which any move gives all the boxes in the chain to the opponent. The goal then is to force the opponent to open the shortest long chains, and thus gain the longer ones themselves.

Player 1 will win in the $4 \times 4$ version of the game if they create an even number of long chains (a chain involving 3 or more boxes). Player 2 can win if they stop the formation of long chains. The most important ways to do this for player 2 are by playing the Block Moves lines depicted below.


The best way to learn, though, is to play! Give it a try!

