ORBITALIS

A Game of Valence

INTRODUCTION:

Orbitalis is a two player abstract strategy game. The object of the game is to create more particles than your opponent. The two players, called "white" and "black", alternately take turns placing their pieces, called "protons" on the game board. Once a proton is played, it is never removed from the board. However, placing a proton can result in adding new electrons of your color, and may also cause the opponent's electrons to be removed from the board. When the board is completely filled with particles (protons + neutrons), the winner is the player with the most number of particles of their color.

EQUIPMENT:

Orbitalis is played on an 11x11 board. A score is kept for each player indicating the total number of particles of their color on the board.

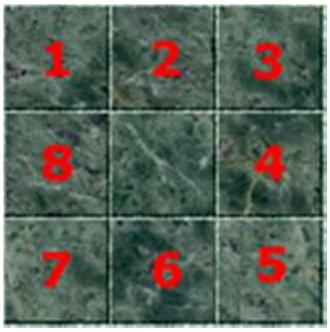
Each player is supplied with a sufficient number of protons and electrons of their color.

Protons are represented by the larger stones:

Electrons are represented by the smaller stones:

RULES:

The players first agree upon their respective color, and beginning with white, the players then take turns placing a single proton on an empty square on the board. For a given square, a "neighboring" or "surrounding" square is any one of the eight squares adjacent to the central square as indicated below.

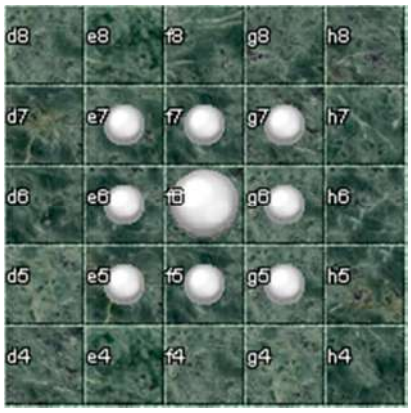


The eight squares which are "neighbors" of the central (unmarked) square

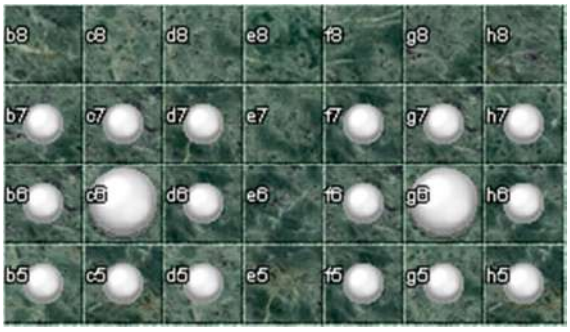
After placing a proton, each of the proton's neighboring squares is examined to determine whether or not an electron is to be added or removed there, and if added, which color the electron should be. Each neighboring square is examined and the number of protons of each color surrounding that square is counted. If the number of white protons exceeds the number of black protons, then a white electron is placed on that square. Conversely, if the number of black protons exceeds the number of white protons, then a black electron is placed on that square. However, if the number of surrounding protons of each color is the same (including the case where there are no surrounding protons of either color) then the square is

empty. Note that if an existing electron is already on that square, it would be removed in that case.

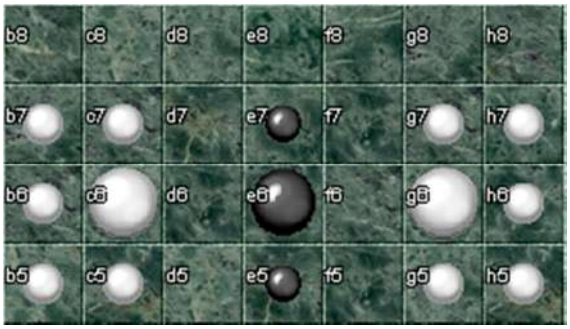
Here, white plays a proton at f6. Since all neighboring squares are surrounded by more white protons (one) than black protons (zero), white electrons are added to all neighboring squares.



Here, black is about to play a proton at e6:



Then after the black proton is placed on e6:



In addition to black's proton, new black electrons are added at e7 and e5 because these squares are surrounded by a greater number of black protons (one black proton) than white protons (zero white protons). Notice that the white electrons at d5, d6, d7, f5, f6, and f7 are removed from the board because after placing the black proton, they are surrounded by an equal number of white and black protons (one proton of each color in this case).
Since white lost six electrons, white's score is reduced by six. Since black gained one proton and two electrons, black's score increased by three.

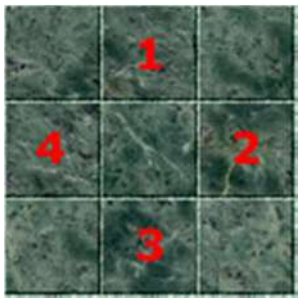
The players continue to play, keeping score as the game progresses, until the board is filled or one player resigns. The player with the most number of particles (protons + electrons) is declared the winner. In Orbitalis, draws cannot occur.

VARIANTS:

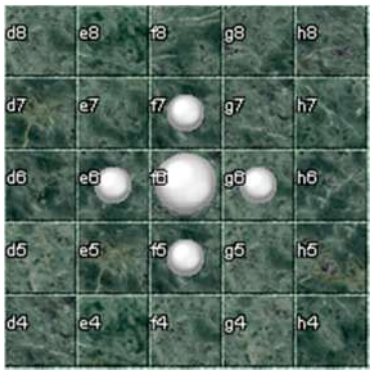
There are two additional variations of Orbitalis. For these variants, the rules are identical, however the number of neighbors considered for a square is different.

The "Orthogonal 4 neighborhood" variant:

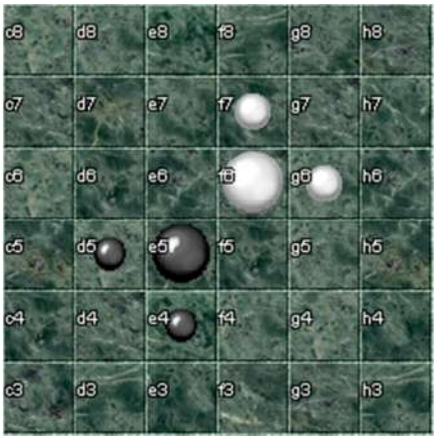
Below, when a proton is placed on the central square, electrons can only be added or removed on the four numbered orthogonal squares.



Here, white plays a proton at f6:

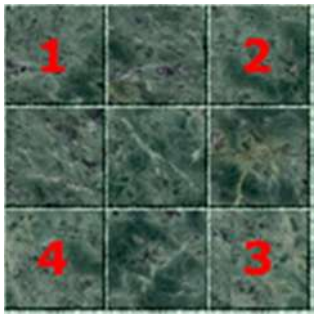


Then after black plays a proton at e5. White electrons at e6 and f5 are removed since both have one orthogonally neighboring proton of each color. Black electrons are added at positions d5 and e4:

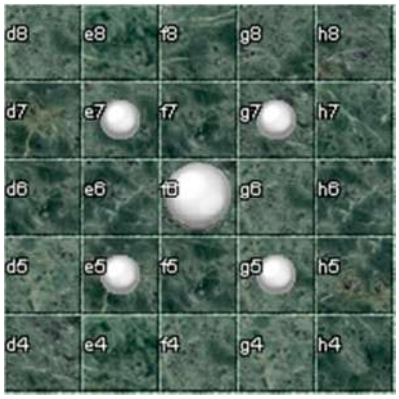


The "Diagonal 4 neighborhood" variant.

Below, when a proton is placed on the central square, electrons can only be added or removed on the four numbered diagonal squares.



Here, white plays a proton at f6:



Then black plays a proton at f5. Since all electrons of either color are diagonally adjacent to a single proton of the same color, all four black electrons are added and no existing white electrons are removed (note: this is called a "stable" configuration).