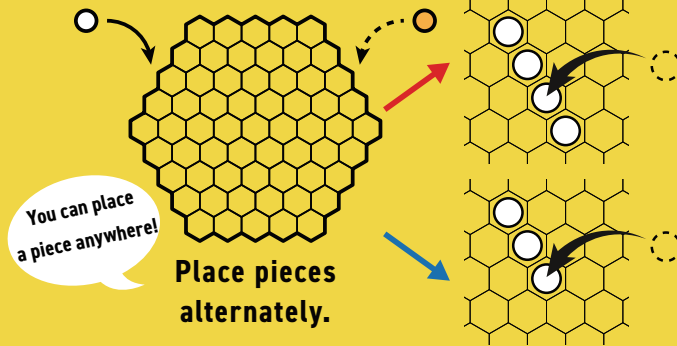


Overview

You take turns placing your pieces one by one. If you put four of your pieces in a straight line, you win, but if you put three of your pieces in a straight line, you lose.



Place pieces alternately.

If you put 4 pieces in a straight line, you win!

If you put 3 pieces in a straight line, you lose!

Components

82 pieces
 (31 yellow, 31 white, 20 red)
 1 board
 1 rulebook

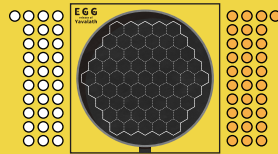
Rules for 2 players

Setup

Place the board in the center of the table.

Each player has either **yellow** or **white** pieces in front of them.

Randomly choose who places their piece first.



First turn

The first player places one piece of **their color** on **any hex** on the board. The other player then has one of the following two options:

- Return the first piece to its owner and place one piece of their color on that hex instead.
- Place one piece of their color on any hex. The player cannot place a piece on an occupied hex.

In either case, the turn of the last player to place a piece ends, and the **next** player takes their turn.

Turn Sequence

You take turns alternately.

On your turn, you place one piece of **your color** on **any hex**. The rules for placing pieces are as follows:

- Place one piece from in front of you.
- You cannot place a piece on an occupied hex.

Ending conditions

The game ends when one of the following conditions is met:

- You put **four or more** pieces in a straight line.
 →You **win**.



- You put **three** more pieces in a straight line.
 →You **lose**.



- "There are four or more pieces in a straight line" and "There are three more pieces in a straight line" occur at the same time.
 →You **win**.



- "There are no empty hexes on the board" and "The above three conditions are not met."
 →**Draw**.

Rules for 3 players

The rules are almost the same as the rules for 2 players, but with the following changes:

- In setup, each player has either **yellow**, **white**, or **red** pieces in front of them. Randomly choose who places their piece first.
- Skip the "First turn" section (P1) and do not replace any pieces.
- On your turn, if the **next player will win** (when the next player places a piece, there will be four or more pieces in a straight line), you **must place** your piece on the hex that will stop that.
- If you lose by placing three pieces in a straight line, you are out of the game. Leave your pieces on the board. Skip subsequent turns.
- In addition to the normal "ending conditions," if **all other players lose**, you **win**.

Note: In rare cases, if the yellow or white player loses early and the game continues, you may run out of red pieces. In that case, use substitutes.

English Rules Available!



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The Story of Yavalath

Cameron Browne

In 2004 I was researching connection games — board games like Hex, Y, Star and Havannah — when I noticed that this family of hundreds of games seemed to share the same fundamental rules and design elements arranged in different combinations. Looking at the broader family of board games as a whole, it became clear that almost all board games share a relatively small pool of game ideas called “ludemes”, and that inventing a new game is as simple as taking some of these existing ludemes and recombining them in new ways; it is the combination that makes each game unique and gives it its particular character. Surely a computer could automate this process?

This question inspired my PhD studies, in which I wrote a computer program called Ludi that modelled games mathematically, then recombined them into new configurations and tested the resulting rulesets for their potential to interest human players. Games were modelled in a simple grammar describing the board, pieces, and start, play and end rules. An initial population of a few dozen games was bred for several generations using a standard genetic programming approach, in which two parents games were chosen from the population and their rulesets crossed over and mutated to create a new child game, which was then measured and added to the population.

Were these newly evolved games playable? Interesting? Did they constitute worthy games in their own right? The only way to answer these questions was to play the resulting rulesets and observe their behaviour that emerges through play. This was done automatically by running AI self-play trials and measuring various trends during play.

Ludi evolved 19 games that it deemed “playable” in November 2007, including Yavalath. While it is difficult to mathematically measure how likely a game is to interest human players, Yavalath showed a number of strong indicators: it is fair, rarely ends in a draw, has suitable game length, combines the familiar “N-in-a-row” premise in an unexpected way, and readily provides interesting puzzles. It is this unexpectedness that is the key to Yavalath’s success, as players want their games to constantly surprise and delight them.

You never know what will emerge from the evolutionary mix! The result is Yavalath, the first game completely invented by computer to be commercially published.



Dr. Cameron Browne
2017, Tokyo