

The Game of Nim
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Introduction

Almost everyone likes to play video games. Did you know that one of the first “video games” originated back in 1951? The Ferranti electrical engineering firm in the United Kingdom built a computer called Nimrod exclusively for the 1951 Festival of Britain. This computer, designed only for playing the game of Nim, allowed players to challenge Nimrod’s artificial intelligence with all kinds of buttons and flashing lights. While Nimrod does not meet all current definitions of a video game, it kept attendees to the Festival well entertained. See [[https://en.wikipedia.org/wiki/Nimrod_\(computer\)](https://en.wikipedia.org/wiki/Nimrod_(computer))].

In the game of Nim, players take turns removing a specific number of objects from a set of objects. With Nimrod, the goal was to be the player removing the last object. There are now numerous versions of Nim, and with many of these versions, *the player who removes the last object is the **loser**!* You and your fellow player will be playing such a version with a pair of Evos.

The Game of Nim with Evo

The game is played by two players A and B. Each player has an Evo loaded with the OzoBlockly program *nim.ozocode*. The game board is a printed copy of the accompanying document *Evo Nim Ozomap.pdf*. A small version of the Ozomap appears in Figure 1.

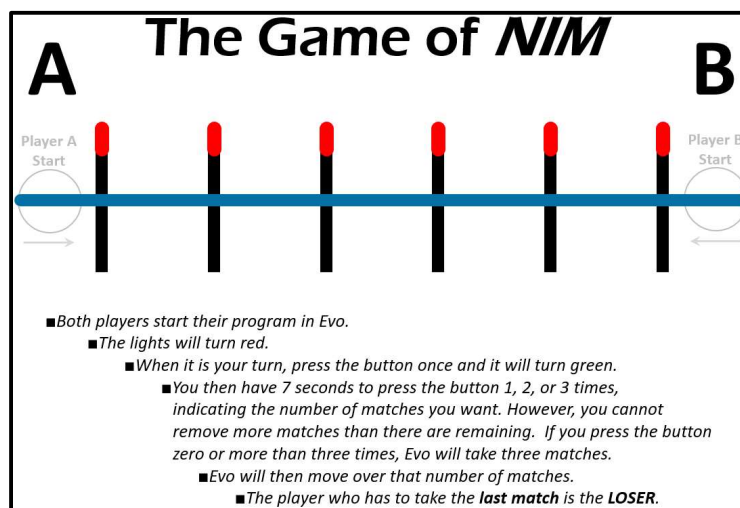


Figure 1

There are initially a group of six matchsticks with player A on the far left and player B on the far right of the sticks. The players place their Evos at the start locations facing the direction shown by the arrows. Players can take turns being first with each new round of play.

A legal move consists of a player removing either 1, 2, or 3 of the matchsticks. However, a player cannot remove more matchsticks than remain in the group. For example, if there are just two matches remaining, then the player must press Evo's button either 1 or 2 times, but not three times. Matchsticks are considered to be removed when Evo moves over them. Players take turns removing matches. *The player who removes the last matchstick loses the game and the other player is the winner.*

The players start the provided program in their Evos. The top lights will turn red. When it is a player's turn, Evo's button is pressed once while the top light is red. The top light will then turn green. The player then has 7 seconds to press the button 1, 2, or 3 times, indicating the number of matches to remove. Evo will then move over that number of matches, "removing" them from the group. The top light then will change back to red. If a player presses the button zero or more than three times while green, Evo will "remove" three matches. Each time the button is pressed during the 7-second green period, the top light will quickly flash white as an indication that the button press was recognized by Evo.

For convenience, the above game rules are summarized at the bottom of the Nim Ozomap.

Sure, you could play this game by manually moving coins over the matchsticks. But it is so much more fun to get your favorite robot, Evo, involved! The cool thing about this game, by the way, is how it teaches you to use *logic* and "*think ahead*".

Finally, it should be noted that the game of Nim cannot end in a draw.