- If a player has one match at the start of their turn, they will lose.

- If a player has 2, 3, or 4 matches at the start of their turn, they will win since they can pick up matches such that the other player will have 1 match at the start of their turn.

- If a player has 5 matches at the start of his turn he will lose since he can not prevent the other player from starting with 2, 3, or 4.

- This pattern repeats so that...

A player... L W L W L ...
If he starts with... 1 2 5 6 9 10 ...

or wins if he starts with \(2 + 4n\) matches

loses if he starts with \(1 + 4n\) matches

where \(n\) is a positive integer.

- A player who starts with 11 matches will always win if he picks up matches so that his opponent starts with \(1 + 4n\) matches.

- If a player starts with 30,

\[30 = x + 4n\]

, let \(n = 7\)

\(x = 2\)

- A player who starts with 30 matches can always win as well.