

# Tip the Dice (Game of 31)

Adapted by Philip B. Yasskin Texas A&M University

This two-player game is similar in style to the Subtraction Game or NIM but with more (or just different) strategy. It

## Rules:

- Start by rolling a six-sided die.
- The number on top is the current total which is shared by both players and will grow as the game proceeds. The players alternate turns.
- On a player's turn, the player tips the die to one of the four sides other than the top or bottom, adds the new top to the current total and announces the new current total. The goal is to be the player who makes the current total become 31.
- If a player makes the current total go over 31, s/he loses.
- If the previous current total is under 31, the player must move.
- So the winner is the person who makes the current total become 31 or forces their opponent to go over 31.

The real question is “What is the strategy for developing a strategy?”



## 掷骰子/31 点游戏

Philip B. Yasskin Texas A&M University 改编

这个双人游戏在风格上类似于减法游戏或 NIM 博弈组合游戏，但有更多(不同)的策略。

规则:

- 首先掷一个六面骰子。
- 掷出来顶部的数字就是一个起点分数，然后玩家们轮流翻动骰子，一直按翻到的数字添加到总分数。
- 每次玩家可以轮流将骰子翻向（除顶部或底部外的）四个方向之一，将新的顶部数字添加到当前总分数中，并成为当前新的总分数。
- 目标1、是成为使当前总分数达到31的玩家。
- 如果玩家使当前总分数超过31，他/她就会输。如果之前的总分数低于31，玩家必须继续翻。
- 所以赢家是让当前总分数变成31或者迫使对手超过31的人。
- 扩展1、假如骰子的第一个起点分数是1，谁有可能是赢家？
- 扩展2、假如骰子的第一个起点分数是2，谁有可能是赢家？
- 扩展3、假果玩家都是蒙上眼睛来参与，会有不一样的答案吗

真正的问题是“制定战略的策略是什么？”



如果玩家变成 3 个人，谁是赢家的概率最小？