Games With Colored Hats

What you need: Several people, lots of hats of different colors, and an impartial referee.

How to play: The players all close their eyes and the referee places hats on everyone's head – maybe all red, maybe all blue, maybe some of each. The players then open their eyes, so each player can see everyone else's hat, but not his or her own. The goal is to guess the color of your own hat. Once you open your eyes, it's illegal to give or receive any information from another player (honor system!) However, the players can discuss strategy beforehand.

Version 1: The team scores a point for each player who guesses correctly.

Version 2: The team scores a point if everyone guesses correctly.

Version 3: The team scores a point if at least one person guesses correctly.

Version 4: The team scores a point if a majority of the players guess correctly.

Version 5: The team scores a point if an even number of players guess correctly.

Research Questions

- How can the team maximize the probability that they win in each of these versions?
- Is it ever possible to guarantee victory?
- What if the hats come in more than two colors?
- What if one of the players is a secret traitor who wants the team to lose instead of win?
- What if one of the players is a traitor, but the other players know who the traitor is?