1 The Golden Ticket Game

Suppose there is a stack of Willie Wonka chocolate bars. The bar on the bottom of the stack contains a golden ticket that will let you visit the Chocolate factory. You and your partner must play a game to decide who gets the golden ticket.

- You must take turns taking chocolate bars off of the top of the stack.
- On their turn, the player can either take 1, 2, or 3 bars.
- The player who takes the last bar of chocolate gets to keep the ticket.

Suppose there are 21 bars in the stack. Does one of the players have a strategy that always wins? What if there are 30 bars in the stack? Or 40?

2 Chomp

- A rectangular chocolate bar is divided into squares in a rectangular grid.
- The upper left corner square is poisoned.
- Players take turns picking squares of chocolate. They have to eat the square they picked and any remaining squares below and to the right of the one they picked.
- The player who eats the poison square loses!

Suppose the grid is 2-by-2. Does one of the players have a strategy that always wins? What if the grid is 3-by-4? Or 5-by-5?

3 Sprout

- Start with some number of dots. (Try 2 first.)
- Players take turns.
- A turn consists of drawing a line between two dots (or a dot and itself, making a loop) and adding a new spot on that line.
- The a line can be straight or curved but it cannot cross itself or another line.
- The new dot can’t be on top of one of the endpoints of the line- it has to break the line up into two lines.
- No dot can have more than three lines attached to it.