MathFest 2015

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Two Person Games

The Subtraction Game:

Start with a pile of **20** chips. Each of the two players take turns removing some chips (**1**,**2**,**3**,**or 4**) from the pile.
- Version 1:   The person who removes the last chip wins.
  Who should go first? What is a good strategy?
- Version 2:   The person who removes the last chip loses.
  Who should go first? What is a good strategy?
- Modifications:
  - Start with **n** chips in the pile.
  - On each turn subtract (**1**,**2**,**3**...**k**) chips from the pile.

NIM:

Start with **3** piles of **3**, **4 or 5** chips. Each of the two players take turns removing any number of chips (at least **1**) from any **1** pile.
- Version 1:   The person who removes the last chip loses.
  Who should go first? What is a good strategy?
- Version 2:   The person who removes the last chip wins.
  Who should go first? What is a good strategy?
- Modifications:
  - Start with different numbers of chips in each pile.
  - Change the number of piles.

Tip the Die:

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 make the current total become 31.
- If the current total goes over 31, the player 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.

Bridges:
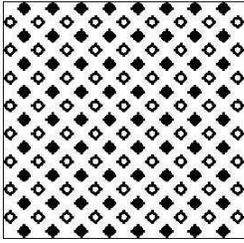
The gameboard is two linked rectangular arrays of white islands and black islands. Two opposite edges belong to the player using the white islands and the other two edges belong to the player using the black islands.

- The players take turns drawing a line between two adjacent islands of their color.
- The winner is the person who connects their two edges.

Hex Bridges:
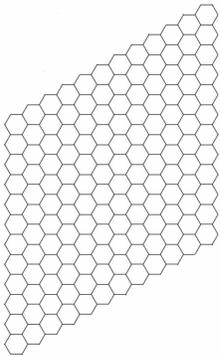
The gameboard is a diamond shaped grid of hexagons. Each player owns two opposite edges of the board. One player has a cup of red stones and the other player has blue stones.

- The players take turns placing a stone in a hexagon.
- The winner is the person who connects their two edges.