The Gale-Berlekamp Switching Game consists of an $n \times n$ grid of lights, with switches for each row and column, and a subset $S$ of lights which are initially on. When a switch is thrown, all lights in the corresponding row or column change states. The goal of the game is to turn off as many lights as possible. The question is: at the end of the game, what is the maximum number of lights that are still on, over all possible starting sets $S$? My research focuses on this question and the generalization to an $m \times n$ grid. I study the problem by looking at the adjacency matrix of a signed complete bipartite graph that corresponds to the initial configuration, and asking what are the possible final configurations. This results in a polytope of final configurations, and using integer programming, the maximum number of lights can be found. (Received September 16, 2008)