

1046-L1-1135      **Matthew M Burke\*** ([mmburke@gwu.edu](mailto:mmburke@gwu.edu)), 801 22nd St NW, #709, Washington, DC 20052.  
*Two-Dimensional Abstract Games.*

An impartial game can be described as one or more piles of beads. The game's rules specify how many beads can be removed from a pile and whether splitting a pile into two (or more) piles is allowed. A pile is assigned a value indicating which player will win under best play. Values for a game of multiple piles are determined as a function of the values of the individual piles. There is a natural order for listing the values for different size piles for a game. This sequence of values, the Grundy Sequence, characterizes each impartial game.

Piles of beads in an impartial game have no internal structure. If the rules allow removal of two beads from a pile, it does not matter which two are removed. I define a two-dimensional impartial game by specifying a spatial structure for the piles: in addition to specifying how many beads can be removed from a pattern, the rules specify constraints on which beads may be removed. For example, a rule might stipulate that two beads can be removed only if they are next to each other.

Spatial patterns do not have a natural ordering, thus an analog for the Grundy Sequence must be developed. This paper describes initial work to find such an analog. A number of open questions, accessible to undergraduates, are raised. (Received September 14, 2008)