Rules[[edit](http://en.wikipedia.org/w/index.php?title=Conway%27s_Game_of_Life&action=edit&section=1" \o "Edit section: Rules)]

The universe of the Game of Life is an infinite two-dimensional [orthogonal](http://en.wikipedia.org/wiki/Orthogonal) grid of square *cells*, each of which is in one of two possible states, *alive* or *dead*. Every cell interacts with its eight *[neighbours](http://en.wikipedia.org/wiki/Moore_neighborhood" \o "Moore neighborhood)*, which are the cells that are horizontally, vertically, or diagonally adjacent. At each step in time, the following transitions occur:

1. Any live cell with **fewer than two live neighbours dies**, as if caused by under-population.
2. Any live cell with **two or three live neighbours lives** on to the next generation.
3. Any live cell with **more than three live neighbours dies**, as if by overcrowding.
4. Any dead cell with **exactly three live neighbours becomes a live** cell, as if by reproduction.

The initial pattern constitutes the *seed* of the system. The first generation is created by applying the above rules simultaneously to every cell in the seed—births and deaths occur simultaneously, and the discrete moment at which this happens is sometimes called a *tick* (in other words, each generation is a pure function of the preceding one). The rules continue to be applied repeatedly to create further generations.