Emerging Order   **Cellular Automata Worksheet**

1. Expresses the following binary numbers in decimal form
   (a) 1110

   (b) 1101010

   (c) 1000111

2. Use the above binaries numbers as transition rules for a 1-D cellular automata and predict the evolution of the initial state 00000100000 for the next 4 time steps. (Note: to represent the binary numbers as a rule make them 8 digit numbers by putting preceding 0's in front of the numbers, then use the 8 digits to decide how to update each of the possible configurations.

3. Copy the following patterns onto the graph paper provided. Use Conway's Rules of Life to see how each of the patterns evolves in time. Take as many time-steps as you need until you can determine the future of the pattern. Describe what you observe quantitatively.
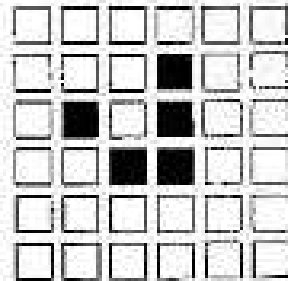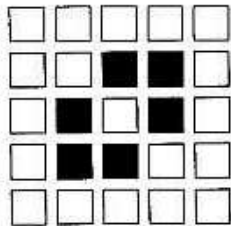
4. Start with your own patterns and find at least one that leads to a steady state and one that oscillates or cycles.