1125-Q5-1011 **Mark C Hughes*** (hughes@mathematics.byu.edu). *Complex behavior from simple rules - cellular automata for Math Circles.*

Cellular automata are complex systems that are based on very simple sets of rules, and can be used to model real world phenomena in physics, biology, and engineering. Because they are so simple to define, they can easily be explained to young students (together with an engaging story), who then quickly begin to iterate 1-dimensional automata using pencil and paper. Higher dimensional (2D) automata can also be demonstrated using software to show the complex patterns that arise.

From this students see first-hand how complex behavior can emerge from very simple rules, and can try to predict the patterns that will develop. They also see how real world systems can be modeled using simple mathematical rules. (Received September 14, 2016)