

962-B1-347

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The purpose of this talk is to demonstrate connections between fractal geometry and abstract algebra by considering certain cellular automata models. We consider models where the alphabet is a finite group  $G$  and the rules use the group multiplication of  $G$ . The resulting patterns are usually very complex and exhibit fractal-like properties. We are currently integrating ideas from this project into our Abstract Algebra sequence. The goal is to help students with important concepts from abstract algebra (such as cosets, quotient groups, automorphisms) by providing a new class of interesting and visual examples from fractal geometry. We will also discuss some of the results of our undergraduate research students over the last 2 years. Their work includes using quotient groups to investigate certain binomial coefficients, 3-D virtual reality modeling of certain automata, and probability plots of 2-D automata systems. (Received September 12, 2000)