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Tom Bates* (tombagoo@gmail.com). *A Generalization of the Chaos Game.*

The well known "chaos game" algorithm that generates the Sierpinski gasket stochastically is generalized beyond the equilateral triangle to any order of regular polygon. A simple formula is derived that gives a value, referred to as the "kissing number," to produce a crisp analog to the Sierpinski gasket for any order of regular polygon and yields an easily understood geometric reason for the value of 0.5 in the equilateral case and the correct value for all other cases. In addition a secondary kissing number is revealed that produces a second fractal figure for each polygon.

Finally, some surprising aspects of what the algorithm is actually doing are revealed, including that the figures created by it contain a deep history of the order of vertices targeted by the algorithm, which is illustrated by assigning a color to each vertex.

This work was performed both to generalize the usual algorithm and to use the understanding gained thereby towards artistic ends. (Received September 26, 2017)