

Tucker Leavitt
Junior Division Mathematics & Computer Sciences
Predicting the Inferno

In this experiment, I studied the spread of fire at a fundamental level and attempted to determine a way to predict this fire with the application of chaos theory. To collect my data, I constructed a small, fixed apparatus, which allowed me to burn a sheet of graph paper in a very controlled environment. After constructing my apparatus, I decided to vary the temperature at which I took my burns to examine how fluctuations in temperature affected the spread of fire. I recorded several burns from my apparatus using a video camera. 15 sheets of graph paper were burned in all, 5 sheets at each 12.8 degrees Celsius, 20 degrees, and 25 degrees. I took these videos and imported them onto my computer where they were manipulated and graphed so that the recorded spreads could be described using numbers. I used these numbers and the fundamentals of chaos theory to form several general rules which fire obeys at a fundamental level, including relationships between time, temperature, and the rate at which fire spreads.