

## **Modeling with Quadratics**

*Michael Reitemeyer*

My students have never done well with quadratics—especially when asked about them months after their unit exam. I plan on aiding retention by originally presenting engaging problems for students to model. One problem asks them to find the maximum height, the time of maximum height, and time of grounding for a firework shot into the air. The other problem shows a big rock thrown down a big hole where students pose the question of how deep the hole is. The goal is for students to recognize the need to use quadratic functions to solve these modeling problems. So my idea is to have students create their own quadratic functions through prior knowledge about linear functions with an opposing force added in (specifically gravity). I plan to use a modeling situation concerning whether or not basketball shots are made with the help of Geogebra to help students see the value of vertex form. Eventually students create the quadratic formula and shortcuts for the vertex of a quadratic on their way to solve these two unit modeling problems.