



## TEACHER PAGE

### Lesson: Graphing Quadratic Equations with a Coefficient of One

Teacher-Author: Ed Anderson  
ASSET Animator: Jonathon Peters

**New Arizona Math Standard 4 Geometry and Measurement      Grades 9-12**  
**Articulated 4MH3-01** Graph a quadratics equation with lead coefficient equal to one.

#### **Learning Objectives: The student will be able to:**

- compute a table of values for a quadratic with a leading coefficient of one.
- plot the table of values to form a quadratic graph.

#### **Overview and Content:**

Students see examples of quadratic equations. They will review and names of the coefficients for a quadratic equation. Students will complete a table of values and plot the points on a coordinate graph. They will be introduced to the axis of symmetry and the vertex for a quadratic equation. Finally, students will solve a variety of quadratics, which will lead to recognizing the shape and direction of opening for a quadratic.

#### **Engage Students:**

Students are introduced to several applications for the quadratic equation. These include the trajectory path of a ball and the suspension cables of a bridge. The students are lead to complete a table of values to develop the quadratic graph. The concept of symmetry is incorporated to aid in the graphing. The student is introduced to the concept of minimum and maximum values for a quadratic.

#### **Follow-up and Extensions:**

Students may search the Internet for additional applications for the quadratic graph. In DIG DEEPER students find a parabola from folding paper around a point. A neat extension to the DIG DEEPER problem could be completed with colorful string instead of folding the paper. The resulting "String Art" would be suitable for displaying in the classroom. (Use heavier paper for the background.) SO WHAT! shows cars, headlights, and parabolas. In TALK ABOUT IT! students follow changes in the shape of the parabolas from using focus points in different locations on a sheet of paper. This is based on the first exercise in DIG DEEPER.

#### **Assessment:**

Students must be able to correctly complete a table of values and plot the corresponding points to form the graph of the quadratic. With the added understanding of symmetry of a graph and recognition of the role of the coefficients from the quadratic, the task of graphing can be quickly mastered.

