

Title: Catapult Trajectories: Don't Let Parabolas Throw You

Brief Overview:

- Students will use a trajectory as a means of learning about a quadratic function.
- Students will model a parabolic path and find the equation of a parabola from given points by solving a system of equations and by using quadratic regression.
- Students will study the effects of the constants a , b , and c through an interactive graphing calculator application and learn to find the coordinates of the vertex.

NCTM Content Standard/National Science Education Standard:

Algebra

- Students will understand patterns, relations, and functions.
- Students will represent and analyze mathematical situations and structures using algebraic symbols.
- Students will use mathematical models to represent and understand quantitative relationships.
- Students will analyze changes in various contexts.

Geometry

- Students will analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.
- Students will specify locations and describe spatial relationships using coordinate geometry and other representational systems.
- Students will apply transformations and use symmetry to analyze mathematical situations.

Data Analysis and Probability

- Students will formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.
- Students will develop and evaluate inferences and predictions that are based on data.

Communication

- Students will communicate their mathematical thinking coherently and clearly to peers, teachers, and others.
- Students will analyze and evaluate the mathematical thinking and strategies of others.
- Student will use the language of mathematics to express mathematical ideas precisely.