

The **Graphing Quadratics** simulation allows students to explore the graph of a quadratic function.

## Explore Screen

In the Explore screen, students can use sliders to investigate the influence each term of a quadratic function has on the graph of the parabola.

**OBSERVE** the curve change as the coefficients change

**LOCATE** values along the curve

**CONTROL** each coefficient of a quadratic function

**VIEW** the individual terms of the function

## Standard Form Screen

In the Standard Form screen, the emphasis is on the vertex, axis of symmetry, and roots. Students can adjust the function but the values are limited to integers.

**IDENTIFY** the parts of a parabola

**VIEW** the vertex, axis of symmetry, and roots

**SHOW/HIDE** all curves on the graph

## Vertex Form Screen

In the Vertex Form screen, students explore transformations of a parabola and identify the relationship between the graphed parabola and the quadratic function.

**CONTROL** the vertex

**SAVE** snapshots and compare parabolas

Graphing Quadratics

Explore Standard Form Vertex Form Focus & Directrix

PHET

## Focus & Directrix Screen

In the Focus & Directrix screen, students generate a parabola based on a vertex and focus.

**DRAG** the focus and see the parabola change

**EXAMINE** the distance of a point from the focus and directrix

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## Suggestions for Use

- Describe how changing the coefficients of a quadratic function changes the graph of the function.
- Predict how the graph of a parabola will change if the coefficients or constant are varied.
- Identify the vertex, axis of symmetry, roots, and directrix for the graph of a quadratic equation.
- Use the vertex form of a quadratic function to describe the graph of the function.

- Describe the relationship between the focus and directrix and resulting parabola.
- Predict the graph of a parabola given a focus and directrix.

### Sample Challenge Prompts

- Play on the Explore screen for 5 minutes. How do  $a$ ,  $b$ , and  $c$  impact the graph of the parabola?
  - Describe the effect  $a$  has on the graph.
  - Describe the effect  $b$  has on the graph.
  - Describe the effect  $c$  has on the graph.
- Using the Standard Form screen, describe how many roots a quadratic function has. Is it possible to ever have more? Is it possible to ever have less?
- Using the Focus & Directrix screen, describe the relationship between the focus, vertex, and directrix.
- Describe the effect  $p$  has on the graph.
  - What would the parabola look like if  $p=0$ ?
  - What would the parabola look like if  $p$  gets very large?

See all published activities for Graphing Quadratics [here](#).

For more tips on using PhET sims with your students, see [Tips for Using PhET](#).