**Supplementary Activity**

**Unit 5 Investigation 7**

**Parabolas**

Open the file: <http://tube.geogebra.org/material/simple/id/1618575>

This applet will help you understand the standard form of the equation of a parabola.

**Recall that *p* represents the displacement of the focus (*F*) from the vertex (*V*).** Since displacement can be negative at times, *p* is negative whenever a) the focus lies below the parabola's vertex (when the parabola's axis of symmetry is vertical) or b) the focus lies to the left of the parabola's vertex (when the parabola's axis of symmetry is horizontal).

Complete this activity once for any parabola with a vertical axis of symmetry. Then repeat this activity once for any parabola with a horizontal axis of symmetry.

1. Move sliders for *p*, *h*, and *k* and observe what happens.
2. How do the value of *p*, *h*, and *k* affect the equation of the parabola?
3. Plot a point on the parabola.
4. Measure the distance from this point plotted to the focus.
5. Measure the distance from this point plotted to the directrix.

1. Drag this point along the parabola now. What do you notice?
2. How does the distance from the vertex to the focus (of *any* parabola) compare with the distance from the vertex to the directrix?