

## Transforming Parabolas Notes

Investigate the impact of the **parameters**,  $a$ ,  $h$ , and  $k$ , in the graphing form of a quadratic function,  $y = a(x - h)^2 + k$ :

Which parameter translates the graph of  $y = x^2$  horizontally (right or left)? What values of the parameter translate  $y = x^2$  to the left? To the right?

The parameter "h" translates  $y = x^2$  left and right. Negative values shift the graph left and positive values shift the graph right.

Which parameter stretches or compresses the graph of  $y = x^2$  vertically? What values of the parameter stretch the graph? What values compress the graph?

The parameter "a" will stretch & compress  $y = x^2$  vertically. When  $a > 1$  or  $a < -1$  the graph will stretch when  $-1 < a < 1$  the graph will compress

What values of which parameter will reflect the graph of  $y = x^2$  across the x-axis?

If "a" is a negative value the graph  $y = x^2$  will reflect across the x-axis.

Which parameter translates the graph of  $y = x^2$  vertically (up or down)? What values of the parameter translate  $y = x^2$  up? Down? Why?

The parameter "k" will shift the graph  $y = x^2$  up or down. If  $k > 0$  the graph will shift up if  $k < 0$  the graph shift down.

Are there any points on the graph of a parabola that have a connection to specific parameters in the equation? Explain.

The parameters "h" and "k" represent the vertex as the point  $(h, k)$ .