

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?

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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?

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

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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?

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

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