Name

Class

Open the TI-Nspire™ document *Families_of_Functions.tns.*

Families of Functions

Student Activity

What effect does changing the parameters of an equation have on its graph? In this activity, you will explore the effects of changing the parameters one at a time.

Move to page 1.2.

Perform the following actions for each page in the TI-Nspire document, and then fill in the table below.

- Click the slider (up or down arrow) on each page to manipulate the variable **a**. Note what **a** does to the graphs of the functions on each page.
- Grab and drag the slider point *h* on each page to manipulate the variable **h**. Note what **h** does to the graphs of the functions on each page.
- Grab and drag the slider point *k* on each page to manipulate the variable **k**. Note what **k** does to the graphs of the functions on each page.

Page	Parent Function (Equation or Type)	Sketch of Parent Function	Effects of Parameter <i>a</i>	Effects of Parameter <i>h</i>	Effects of Parameter <i>k</i>
1.2					
2.1					
3.1					
4.1					
5.1					
6.1					
7.1					

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I.1 1.2 2.1 ▶ Families_...rev
Algebra 2

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Families of Functions

the effects on its graph.

Change the parameters of an equation to observe

Use the sliders to change the parameters. Click on the slider's up and down arrows or move the slider left/right or up/down along the number line.

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- 1. Given any function, describe the effects parameter *a* has on its graph when:
 - a. |*a*| > 1
 - b. 0 < |a| < 1
 - c. *a* < 0
 - d. *a* = 0
- 2. Given any function, describe the effects parameter *h* has on its graph when:
 - a. *h* > 0
 - b. *h* < 0
 - c. *h* = 0
- 3. Given any function, describe the effects parameter *k* has on its graph when:
 - a. *k* > 0
 - b. *k* < 0
 - c. *k* = 0
- 4. Given the following functions, describe the transformations on the parent function, f(x). a. $f(x) = x^2$; $h(x) = 3(x-4)^2 + 2$
 - b. $f(x) = x^3$; $g(x) = -(x-1)^3$
- 5. Given the following transformations, write the equation of the function.
 - a. The graph of $f(x) = \sqrt{x}$ is reflected over the *x*-axis, vertically stretched by a factor of 2, and translated vertically down 1 unit.
 - b. The graph of f(x) = |x| is translated horizontally to the left 3 units and translated vertically up 5 units.