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## An Investigation into how to effectively Change the Graphs of an Exponential Equation!

The objective of this lesson is to manipulate variables in exponential equations to see how the changes affect the graph.

Remember the equation for an exponential function is  $y = a(b)^x$

When using Desmos make sure you change one thing at a time to see how it affects the graph.

**Fix it #1:**

What did you change?

What was the final equation you created?

How did it effect the original graph?

**Fix it #2:**

*Hint:  $\{x > -7\}$  Represents that the function only looks x values greater than negative 7.*

What did you change?

What was the final equation you created?

How did it effect the original graph?

**Fix it #3**

What did you change?

What was the final equation you created?

How did it effect the original graph?

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#### Fix it #4

What did you change?

What was the final equation you created?

How did it effect the original graph?

#### Prediction #1

Write your prediction here and in the box on your computer.

Was your prediction correct?

What happened when -3 was changed to 3?

#### Prediction #2

Write your prediction here and in the box on your computer.

Was your prediction correct?

What happened when -4 was changed to 4?

#### Prediction #3

Write your prediction here and in the box on your computer.

Was your prediction correct?

What happened when 2 was changed to 1.2?

#### Prediction #4

Write your prediction here and in the box on your computer.

Why will your prediction work?

Was your prediction correct?

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### Challenge Slide #1:

List all of the equations you used to be successful.

*Hint: Make it successful first and then write the equations down.*

*Hint: Think about restrictions on the x-values.*

### Challenge Slide #2:

List all of the equations you used to be successful.

### Challenge Slide #3:

List all of the equations you used to be successful.

### Challenge Slide #4:

List all of the equations you used to be successful.

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List rules that we have learned:

For example: When  $b$  is greater than 1 it is exponential growth. When  $b$  is less than 1 it is exponential decay.