**Multiple Representations and Key Features of Exponential Functions**

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Exponential functions \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ at an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rate, or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ at a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rate. Their graphs \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .

Explicit exponential equations can be written as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, where the variable \_\_\_\_\_\_\_\_\_ represents the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the variable \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ represents the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Recursive exponential equations can be written as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, where the variable \_\_\_\_\_\_\_\_\_ represents the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the variable \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ represents the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

If $b>1, $ then there is exponential \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This means that as the independent variable increases, the dependent variable is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ at an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rate.

If $0<b<1$, then there is exponential \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This means that as the independent variable increase, the dependent variable \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ at a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rate.

**Example**: In August 2011, the population in the United States was approximately 312 million. Suppose that the population grows at a rate of 1.7% of the population each year. Represent this rate of growth with a table, graph, symbols, and words.



**Independent Practice**

In science class you are studying bacteria growth. In your petri dish there are 12 bacteria. After one minute each bacterium splits in two creating 24 bacteria. After another minute each bacterium again splits in two creating 48 bacteria. Model the growth of the bacteria by using a table, graph, words, and symbols.

