

# How do you interpret a semi-log graph and what are some examples?

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## RECOMMENDED CITATION

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A semi-log graph is a type of graph that has a logarithmic scale on one axis and a linear scale on the other. This allows for a better representation of data that has a large range of values. The logarithmic scale on one axis compresses the data, making it easier to visualize and interpret.

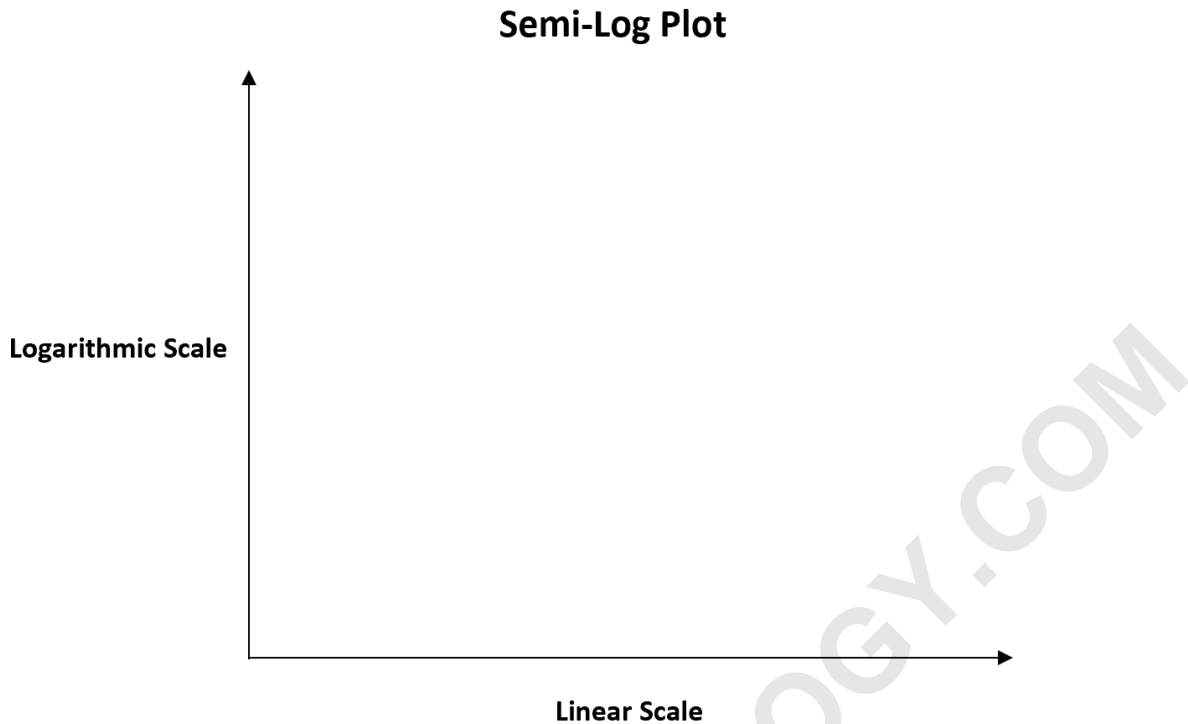
To interpret a semi-log graph, one must first understand the logarithmic scale. On a logarithmic scale, each tick mark represents a multiple of the previous tick mark, rather than a fixed value. For example, on a base 10 logarithmic scale, the tick marks would be 1, 10, 100, 1000, and so on. This means that the distance between tick marks increases as the values increase.

In a semi-log graph, the axis with the logarithmic scale typically represents data with a large range of values, such as population or economic growth. The linear scale axis represents data with smaller, more evenly distributed values, such as time or distance. This allows for a clearer visualization of the relationship between the two variables.

Some examples of when a semi-log graph may be used include analyzing population growth over time, tracking changes in stock prices, or studying the spread of infectious diseases. In these cases, the logarithmic scale helps to show exponential or rapid changes in the data, which may not be easily visible on a traditional linear graph. Overall, a semi-log graph is a useful tool for interpreting and analyzing data with a wide range of values.

## Read a Semi-Log Graph (With Examples)

**A semi-log graph is a type of graph that uses a linear scale on the x-axis and a logarithmic scale on the y-axis.**



We often use this type of graph when the values for the y variable have much greater variability compared to the values for the x variable.

This type of graph is particularly useful for visualizing percentage change of some variable over time.

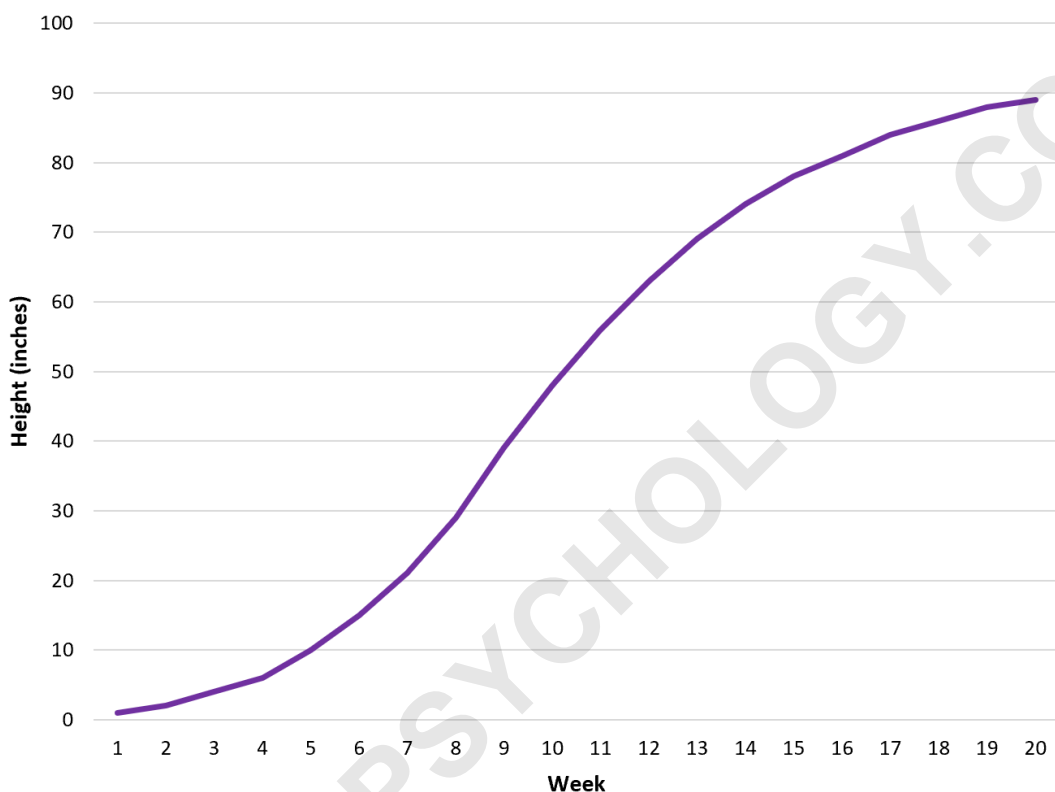
The following examples show how to read semi-log graphs in practice.

#### Example 1: Semi-Log Graph for Plant Growth

Suppose a biologist wants to create a line chart to visualize the growth of a certain plant during a 20-week

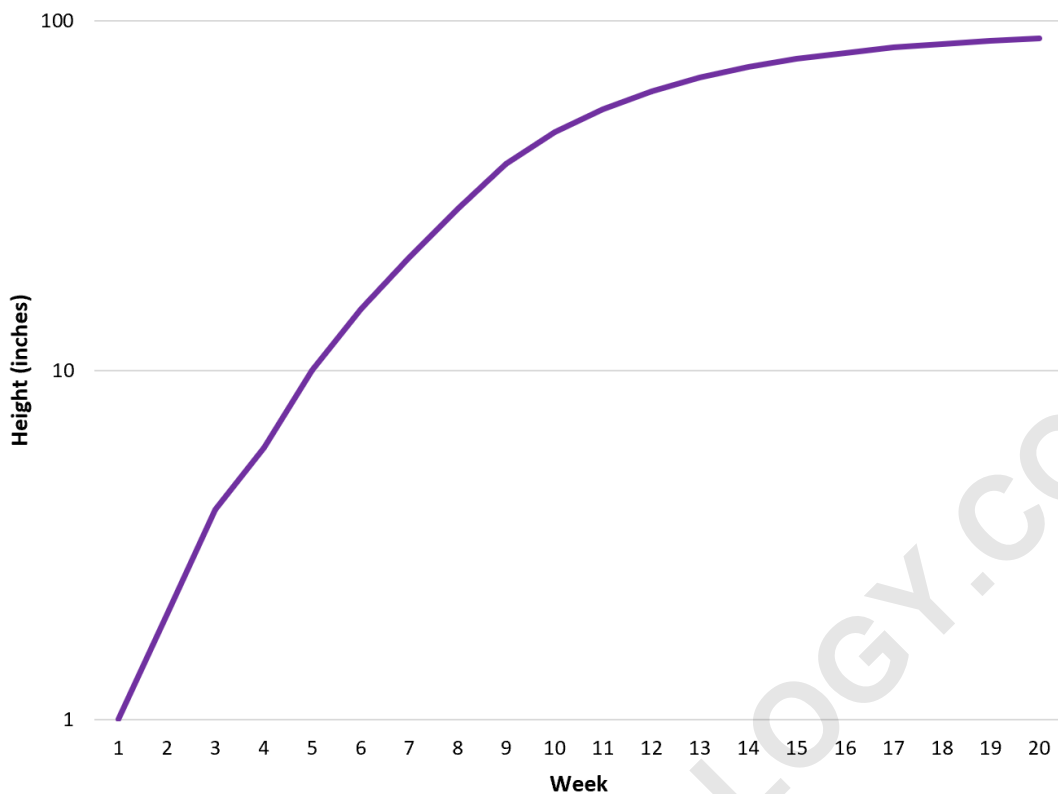
period.

She first creates the following line chart using a linear scale on the y-axis:



This chart is useful for visualizing the raw change in plant height from one week to the next.

However, she can use a semi-log graph to more easily visualize the percentage change in plant height from one week to the next:



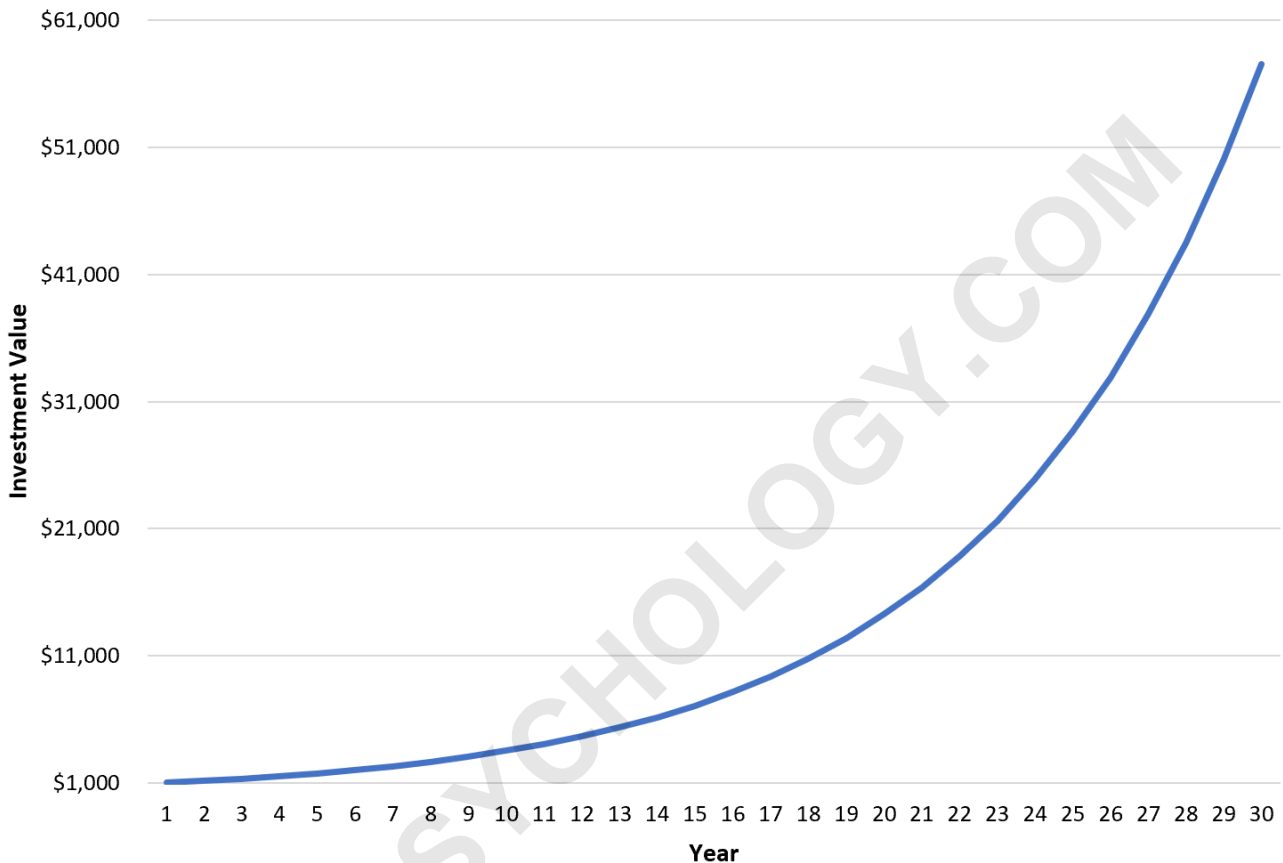
**Notice that the y-axis is measured on a logarithmic scale.**

**Using this graph, we can see that the percentage growth of the plant is quickest in the early weeks and then slows down dramatically in the later weeks.**

**Example 2: Semi-Log Graph for Investment Growth**

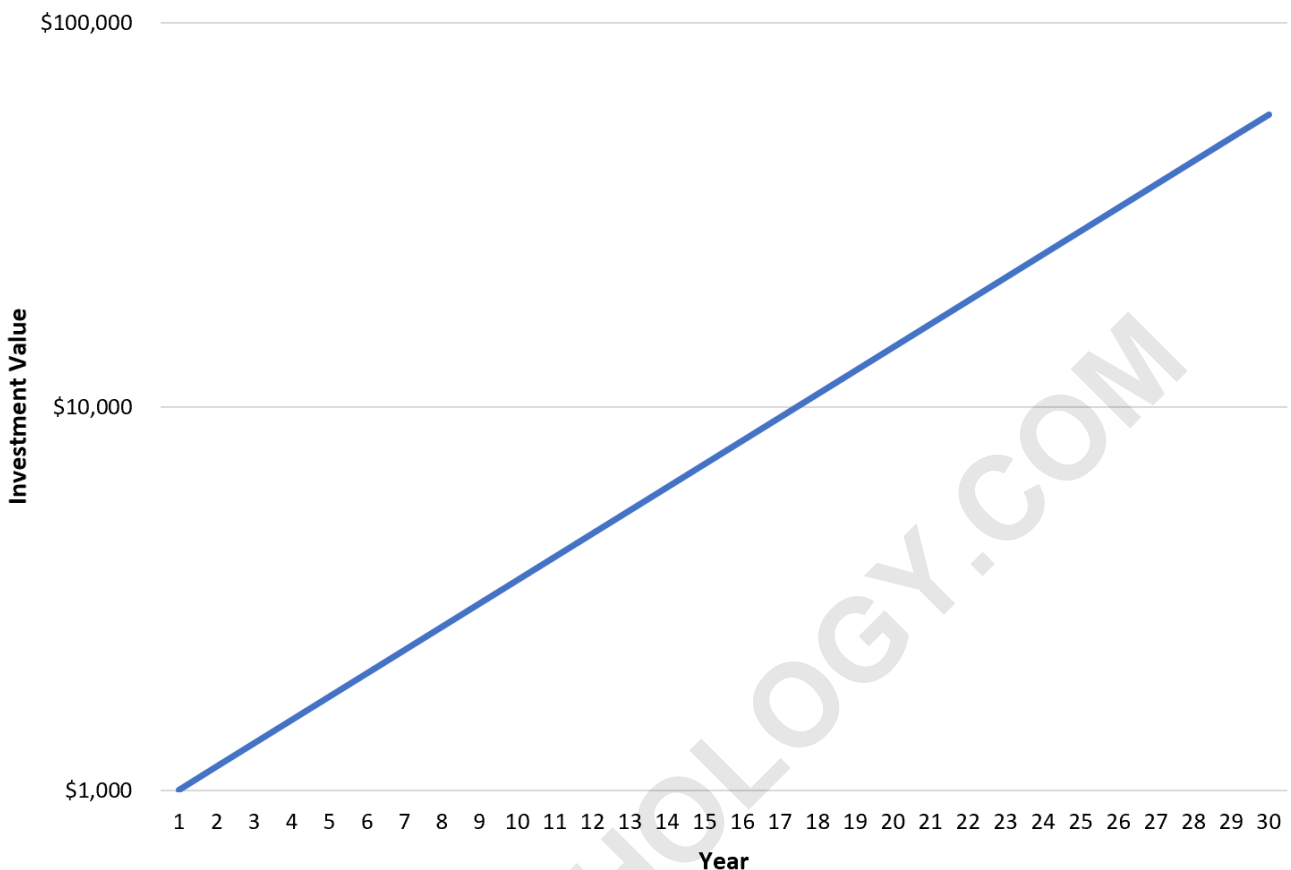
**Suppose an investor wants to create a line chart to visualize the growth of a certain investment during a 30-year period.**

He first creates the following line chart using a linear scale on the y-axis:



This chart is useful for visualizing the raw change in the investment value from one year to the next.

However, he can use a semi-log graph to more easily visualize the percentage change in the investment value from one year to the next:



**Notice that the y-axis is measured on a logarithmic scale.**

**Using this graph, we can see that the percentage growth of the investment is actually consistent from one year to the next.**

**The following tutorials offer additional information on using log scales in plots:**