

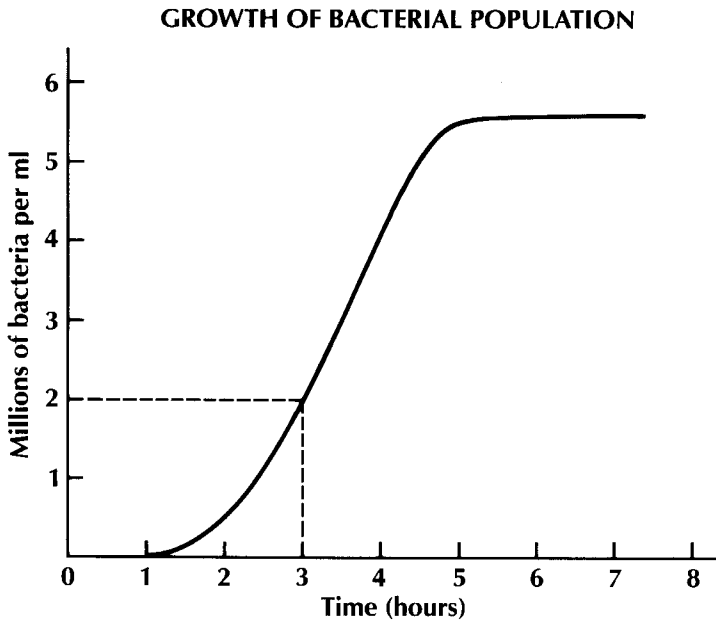
# Graphic Organizing: Line Graph

A line graph is the perfect tool to use when you want to illustrate the changes that take place in one quantity over time or when you want to show how one quantity changes in response to change in another quantity. The data that describe these interactions appear on the graph as dots, connected to form a line or curve. Each dot, or plot, signifies that a relationship exists between a specific measurement on the horizontal scale at the bottom of the graph and a specific measurement on the vertical scale at the left edge of the graph. The line that connects all the dots together graphically illustrates the pattern of these relationships. When more than one line appears on the same graph, each one illustrates the pattern of relationships for a different category of data.

It's easy to obtain data from a line graph. When you want to know the corresponding quantity on the vertical scale for a specific quantity on the horizontal scale, use a straightedge to mark the data line directly above the quantity on the horizontal scale that interests you. Then use the straightedge to find the quantity on the vertical scale directly to the left of your mark. Follow these steps in reverse order when you want to find the quantity on the horizontal scale that corresponds to a specific quantity on the vertical scale.

## Practice Interpreting a Line Graph

The following line graph shows how the size of a bacteria population changed over an eight-hour period.



Familiarize yourself with the graph, and then answer the following questions.

1. What does the scale on the horizontal axis of the graph measure? \_\_\_\_\_  
\_\_\_\_\_
2. What quantity does one unit on the horizontal scale equal? \_\_\_\_\_

3. What does the scale on the vertical axis measure? \_\_\_\_\_  
\_\_\_\_\_
4. What quantity does one unit on the vertical scale equal? \_\_\_\_\_  
\_\_\_\_\_
5. What specific information can you learn from the graph? \_\_\_\_\_  
\_\_\_\_\_
6. How large was the bacteria population at the end of the fifth hour? \_\_\_\_\_  
\_\_\_\_\_
7. At what point were there 3 million bacteria per milliliter? \_\_\_\_\_

## How to Construct a Line Graph

1. Create the horizontal x-axis and the vertical y-axis of the graph.
2. Create scales on both the x- and y-axes. Make sure they will accommodate all of your data. For example, if the largest quantity you plan to measure on the x-axis scale is 42 units, consider creating an x-axis scale with 9 divisions, each of which is 5 units long.
3. Number the divisions of the scales.
4. Label the scales. For example, if the line on the graph will illustrate changes in the length of an organism measured in millimeters over a period of three years, label the x-axis scale *Time (years)* and the y-axis scale *Length (millimeters)*.

Raw data for a line graph usually appear in data table form. Quantities measured on the horizontal scale usually appear in the left-hand column. Quantities measured on the vertical scale usually appear in the right-hand column.

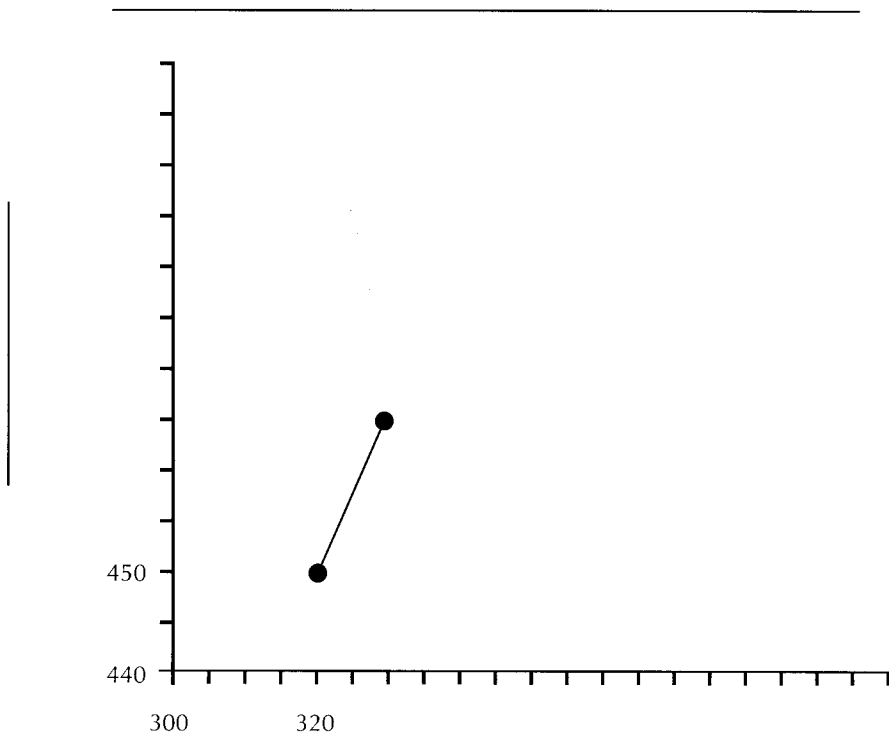
5. Locate the first quantity in the left-hand column of the table on the horizontal scale of the graph. Using a straightedge and a pencil, draw a faint vertical line from that point across the field of the graph.
6. Locate the first quantity in the right-hand column of the table on the vertical scale of the graph. Starting at that point, draw a faint horizontal line across the field of the graph.
7. Draw a small dot, or plot, where the two lines cross.
8. Repeat steps 5–7 for the remaining pairs of data in the table.
9. Connect the plots to form a smooth line or curve. (In some cases, the plots may not fall on the line or curve. You may need to draw the line or curve so that it passes near or between plots.)
10. If the graph will contain more than one line of data, label the line you just created.
11. Repeat steps 5–10 for each additional line of data.
12. Give the graph a title.

# Practice Constructing a Line Graph

1. Look over the following data:

IRISH ELK	
<i>Antler Size (mm)</i>	<i>Skull Length (mm)</i>
320	450
330	465
350	480
365	485
390	490

2. Number the remainder of the x-axis scale on the graph below.
3. Label the x-axis scale.
4. Number the remainder of the y-axis scale.
5. Label the y-axis scale.
6. Plot the remaining data in the table.
7. Connect the plots to form a curve.
8. Give the graph a title.



## More Practice

1. Look over the following data:

POPULATION OF SELECTED THREATENED AND ENDANGERED SPECIES			
Species	1950	1960	1970
Whooping Crane	24	41	78
California Condor	56	43	46

2. Construct a line graph using this data. Keep track of the year on the x-axis. Keep track of the number of animals on the y-axis.

