Skills Worksheet

Science Skills

Making a Line Graph

Making a graph helps you see how two factors called variables are related. For example, suppose you spent the day at a public swimming pool, and every hour you counted how many people were there. Your two variables are the time of day and the number of people at the pool. You can make a graph to see how pool attendance and time of day are related.

   A line graph (also called a Cartesian graph or an *x-y* graph) has a horizontal *x*-axis and a vertical *y*-axis. The basic steps in making this type of graph are listed below.

As you read each numbered paragraph, follow the instructions to make a graph of the data found in the table on the next page.

1. **Assigning the Axes**

   When you start to make a graph, you decide how to plot the data. Should the time of day be from left to right on the *x*-axis, or up and down on the *y*-axis? You decide *when* to count people, so time is your independent variable, the one you control more directly. Usually this one is put on the *x*-axis.

   The number of people at the pool, on the other hand, changes with time. It is a dependent variable that changes due to the time. So you would write "time" on the *x*-axis and "number of people" on the *y*-axis.

2. **Scaling the Axes**

   Now you need to decide how low and how high your numbers will go on each axis. You must include all of the data points. Allowing as much space as possible on each axis will make the graph easier to read.

   Suppose you were at the pool from 10:00 A.M. to 7:00 P.M., and the number of people you counted ranged from 11 to 53. You would probably want to number the *x*-axis from 10:00 A.M. to 7:00 P.M. and the *y*-axis from 0 to 60.

3. **Plotting Data**

   Each time you counted the people at the pool, you collected the data for one point on your graph. That point has an *x* value (time of day) and a *y* value (number of people).

   To plot the data from the table, find the value on the *x*-axis that matches the *x* value of the first data point. Find the *y* value of the same point on the *y*-axis.

   Using your graph paper as a guide, imagine a line going straight up from your *x* value. (Draw a very light line using a ruler if it helps.) Imagine (or draw) another line going to the right from your *y* value. Draw a dot where these two lines meet for your first data point. Repeat these steps to plot the rest of your data.

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4. **Making the Line or Curve**

After you have plotted all of your data, examine the points with the help of a ruler. Do the points look like they should form a straight line? If so, use the ruler to draw a line through as many points as possible on the graph.

If the points do not appear to form a line, do they look like they should form a smooth, continuous curve? If they do, carefully draw a smooth curve that goes through as many of the points as possible. If they do not, draw a curve that bends as necessary to connect all of the points.

Time of day	Number of people
10:00 A.M.	11
11:00 A.M.	23
12:00 (noon)	42
1:00 P.M.	53
2:00 P.M.	47
3:00 P.M.	41
4:00 P.M.	33
5:00 P.M.	42
6:00 P.M.	38
7:00 P.M.	22