

Name: _____ Period: _____

Science Skills Worksheet

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 bottom of this 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.

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	10 am	11 am	12 pm	1 pm	2 pm	3 pm	4 pm	5 pm	6 pm	7 pm
No. of People	11	23	42	53	47	41	33	42	38	22

MAKING AND INTERPRETING BAR AND PIE GRAPHS

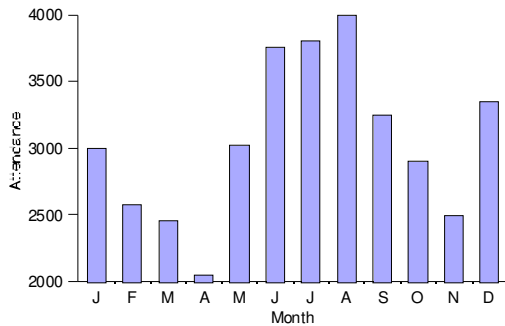
Bar Graphs

Graphs make it easier to interpret certain kinds of information. In a bar graph, different bars stand for different quantities, and you can compare the quantities by comparing the height of each bar. The bar graph below, on the left, shows the monthly attendance at a certain movie theater.

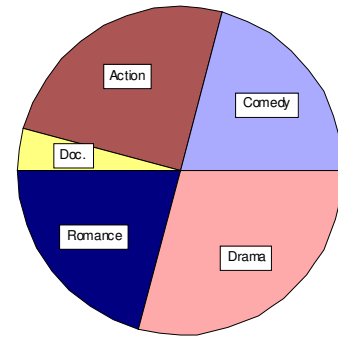
Pie Charts

In a pie chart, a circle is divided into parts. The area of each part compared to the area of the whole circle represents a percentage. For example, half of the circle represents 50 percent. The pie chart below shows the attendance for different kinds of movies at the same theater.

Example of a Bar Graph



Example of a Pie Chart



Practice

Using the graph and chart above, answer the following questions. Write the answers on your graph paper.

1. Which month had the greatest movie attendance?
2. What was the most popular kind of movie?
3. What percentage of the movies were action films?

Suppose that the movies you saw last year have been recorded in the table below. Make a bar graph and a pie chart of this information on your separate sheet of graph paper. The bar graph should show the number of movies seen each month. The pie chart should show the different kinds of movies seen.

Movies Seen During the Year

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Action	2	1	1	0	0	2	0	3	0	1	0	3
Drama	0	1	0	0	1	1	2	1	1	1	0	0
Comedy	1	0	0	1	0	1	2	0	1	0	0	1
Romance	0	0	0	0	2	0	1	0	0	0	0	0