Climate Graphs

A climate graph displays two or more climate variables such as mean temperature and mean precipiation for a given place. The data are generally displayed by month. In this format, a climate graph allows for a quick, generalized assessment of the average climate for a given place. Thus, a climate graph is an effective graphing tool for displaying the average temperature and average precipitation of a location. By combining a line graph showing temperature fluctuations over the course of a year and 12 bars representing the monthly rainfall, a quick understanding of climate at this location is revealed.

How to make a climate graphy
To make a climate graph, it is fairly simple.
? Step 1 – Make the axes
   (a) Draw ONE horizontal line for the x-axis
   (b) Draw TWO vertical lines at either end of the horizontal x-axis
       line for the two y-axes.

When finished Step 1, you should have a graph similar to this outline.

? Step 2 – Label the x-axis.
   Since the climate graph represents climate in one location for one year, divide the x-axis into 12 equal segments. Each segment is one month (e.g., Segment 1 is January, Segment 2 is February and so on to Segment 12 which is December).

? Step 3 – Label the y-axes
   The RIGHT y-axis is most often TEMPERATURE. Determine the minimum and maximum temperatures. The difference between the maximum temperature and the minimum temperature is the **temperature range**. For example, the location has a maximum temperature of +40°C and a minimum temperature of -40°C. Thus, the temperature range is 80°C. You need to make equal segments to cover the range of 80. If each segment was 10°C, you would have eight equal segments on your temperature y-axis (i.e., -40°C, -30°C, -20°C…+30°C, +40°C).

   Repeat this process for the LEFT y-axis of PRECIPITATION. In this case, the smallest value for precipitation would be zero. Thinking it through, you

could not have negative precipitation. You can have either no precipitation or some precipitation. So, find the maximum precipitation, and then, divide this y-axis into equal segments starting at the minimum of zero and going to the maximum amount. If the maximum precipitation was 200 mm, you could make four equal segments each representing 50 mm of precipitation (i.e., 50 mm, 100 mm, 150 mm and 200 mm).

? Step 4 – Data Input
From your dataset, input the data.

Temperature is represented with a LINE GRAPH. You read the temperature using the RIGHT y-axis. Place on dot on the graph for each month and then, because it is a trend over time, join the dots together with a line.

Precipitation is represented with a BAR GRAPH. You read the precipitation level using the LEFT y-axis.

? Step 5 – Title, Units of Measurement and Total Annual Precipitation
The title is the LOCATION. If you made a climate graph of Kingston, the title is Kingston. The title goes across the top of the climate graph.

The x-axis needs to be labeled MONTHS

Each y-axis needs to be correctly labeled and the units of measurement included. For example, the right y-axis is Temperature (^{O}C) while the left y-axis is Precipitation (mm)

Total Annual Precipitation is added directly below the title.

Your finished product should look something like this climate graph with a bar graph and a line graph.
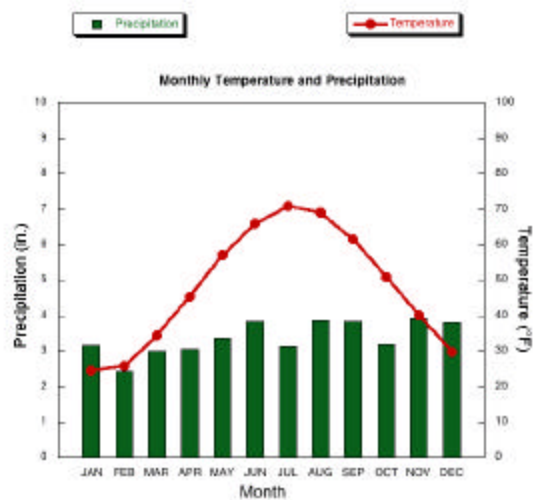
So…how do you use a climate graph?

Every location on earth has characteristics that distinguish it any other place. As geographers, we describe a place in terms of its physical and human characteristics. Climate is an essential part of a place's physical characteristics. Climate can impact the types of vegetation, species and diversity of wildlife, human habitation patterns and techniques, and cultural and historical change.

One of the most visible ways to describe a place's climate is a climate graph. While a climate graph does not provide complete climate information, it does illustrate two of the most important elements of climate: precipitation and temperature.

Many characteristics of a place can be inferred by interpreting the climate graph. As well, we can use climate graphs to compare between places.

Definitions
? **Weather –** Day-to-day atmospheric conditions in a particular place for a short period of time, or the state of the atmosphere at a given time and place. Weather can change from hour-to-hour, day-to-day, and season-to-season.
? **Climate-** The average weather for a particular region and time period. Climate is not the same as weather; rather, it is the average pattern of weather for a particular region. Weather describes the short-term state of the atmosphere. Climatic elements include precipitation, temperature, humidity, sunshine, wind velocity, phenomena such as fog, frost and hail-storms, as well as other measures of the weather.
? **Precipitation -** The falling to earth of any form of water (i.e., rain, snow, hail, sleet or mist).
? **Temperature -** Temperature is a physical property that underlies the common notions of hot and cold (e.g., something that is hotter has the greater temperature).   Thus, temperature is a measure of hot and cold.
? **Climate graph -** A graph that shows a place's yearly climate patterns

Once you have made a climate graph, examine it for patterns or trends. Is there more precipitation in the summer months (July to September) than the winter time (January to March)? Is the difference in air temperature between summer and winter large or small?

A small amount of precipitation in all months could suggest a desert climate. If temperatures were high to very high in the same place, you also would suspect a desert.   Likewise, high temperatures and a corresponding high rainfall often concentrated in one period of the year would suggest a tropical climate.

You will learn that some of the climate graph trends are influenced by factors such as closeness to a large body of water, latitude or mountain ranges. The climate graph will help you visualize these factors.

Activity

Table 1 is 2005 Kingston temperature and precipitation data. Make a climate graph.

Table 1. 2006 Kingston Mean Monthly Temperature and Total Precipitation

Month	Mean Temperature (°C)	Total Precipitation (mm)
January	-8.1	52.4
February	-5.1	58.6
March	-1.7	29.2
April	7.4	108.0
May	12.0	16.0
June	21.6	26.8
July	23.6	60.3
August	22.2	125.7
September	18.3	97.6
October	10.7	109.6
November	5.2	136.0
December	-4.1	81.1
Total Annual Precipitation (mm)		901.3

Table 2 is 1968 Kingston temperature and precipitation data. Make a climate graph.

Table 2. 1968 Kingston Mean Monthly Temperature and Total Precipitation

Month	Mean Temperature (°C)	Total Precipitation (mm)
January	-10.5	78.7
February	-8.8	41.4
March	-0.3	57.7
April	8.2	37.1
May	11.0	132.8
June	16.8	88.1
July	20.5	27.7
August	19.5	76.5
September	17.4	108.7
October	11.0	78.7
November	2.0	142.7
December	-6.2	99.6
Total Annual Precipitation (mm)		969.7

Compare the two climate graphs. Has any noticeable shift occurred?