

Name _____

Human Physiology 2134

Graphing Lab

Dr. Gaines

OBJECTIVE: To familiarize students with how to graph.

HOW TO CHOOSE WHICH TYPE OF GRAPH TO USE?*

When to Use:

- **a Line graph.**

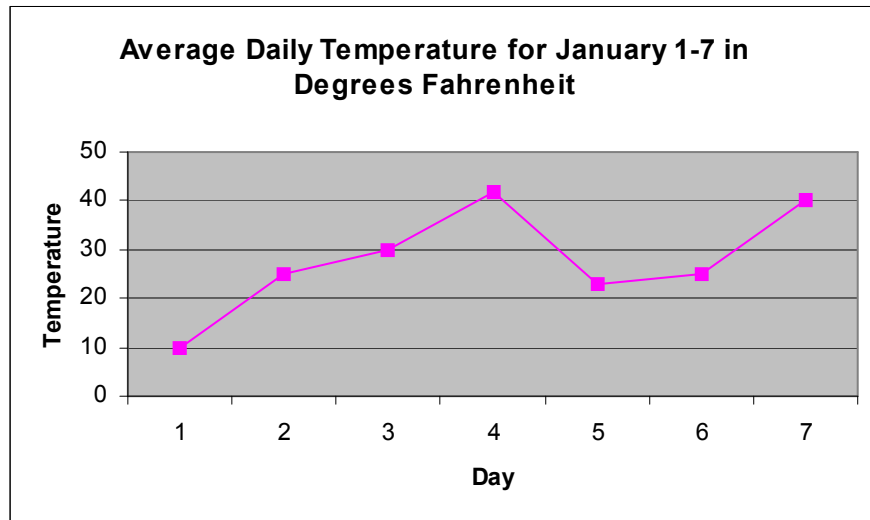
Line graphs are used to track changes over short and long periods of time. When smaller changes exist, line graphs are better to use than bar graphs. Line graphs can also be used to compare changes over the same period of time for more than one group.

Here is an example of a Line Graph

First you need the data**:

Average Daily Temperature for January 1 – 7 in Degrees Fahrenheit

Day	Temperature
1	10
2	25
3	30
4	42
5	23
6	25
7	40



Y-axis

X-axis

We will be using this type of graph the most in this class. The features you need to include are:

Title of the Graph. In this case the title is “Temperature per Day”.

Label for X-axis and Y-axis. Without these labels we won’t know what the graph is trying to tell us.

Watch Increments (both X and Y axis). Your increments need to be consistently and evenly spaced on your X-axis and Y-axis.

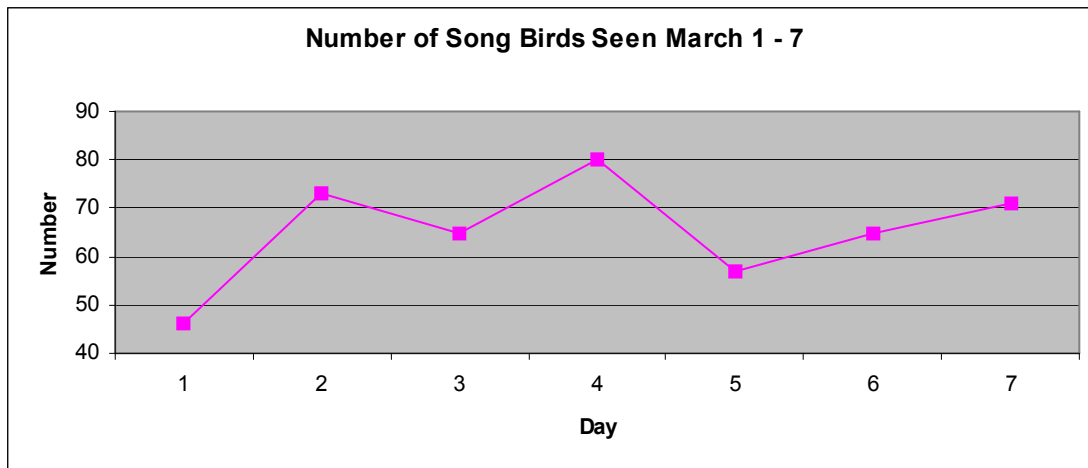
Use as much of the graph as possible. Keep in mind that not all X and Y values will need to start at 0. Look at the following data.

Draw the type of graph requested. – If you are asked for a line graph, make a line graph; if you are asked for a bar graph, draw a bar graph. If a type of graph is not specified, draw the type of graph you want.

Only graph the data you are asked to graph. Occasionally you will be presented with several sets of data. Only graph the set you are asked to graph.

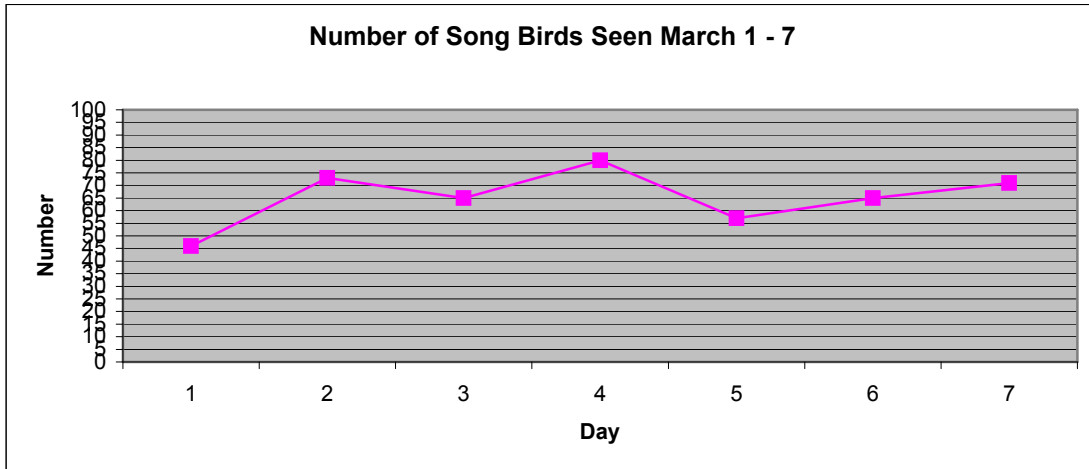
Number of Song Birds Seen March 1 - 7

Day	Number
1	46
2	73
3	65
4	80
5	57
6	65
7	71



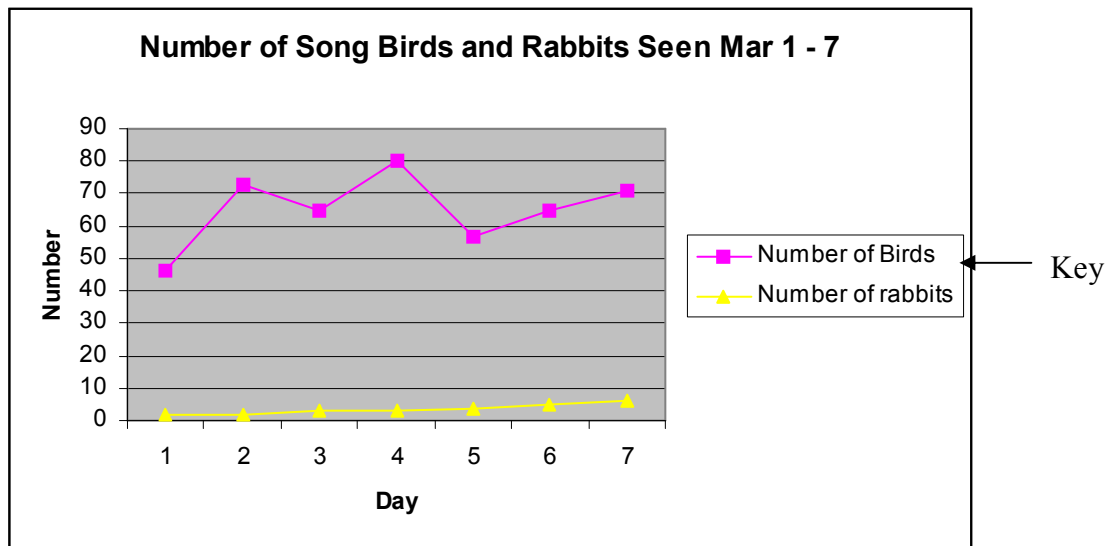
Thus you need to fit your graph to your data. By spreading out the data points on the graph you can get a better understanding of what is happening as the data is being collected. NOTE that the Y-axis values go from 40 to 85.

Do not try to “save” space on your graph by clumping your data:



In this example the values for the Y-axis are clumped together, making it harder to determine the data values for each of the points. NOTE that the Y-axis values go from 0 to 100.

Here is a line graph for comparing one or more groups' data:



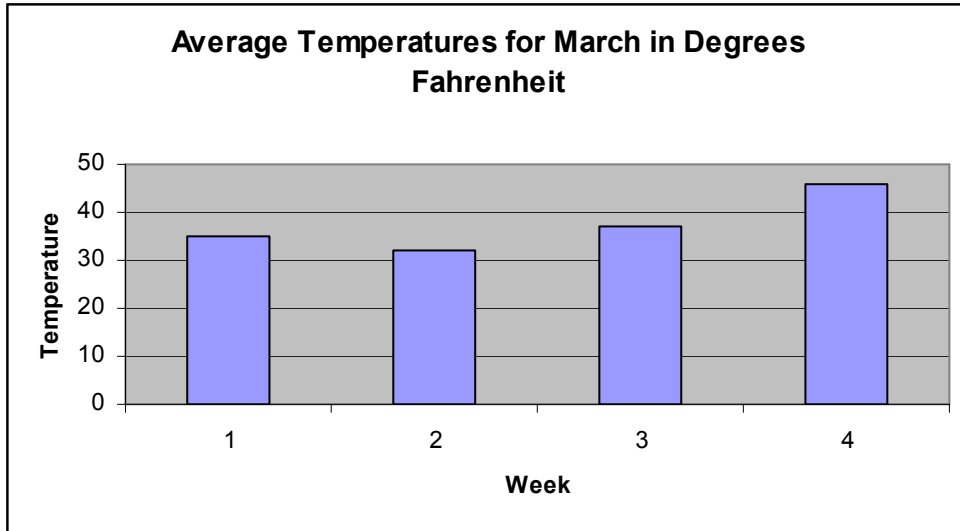
When graphing more than one set of data on a graph you need a key to let your viewer know which set of data is which. That's why I've included the key next to the graph.

- **a Bar Graph.**

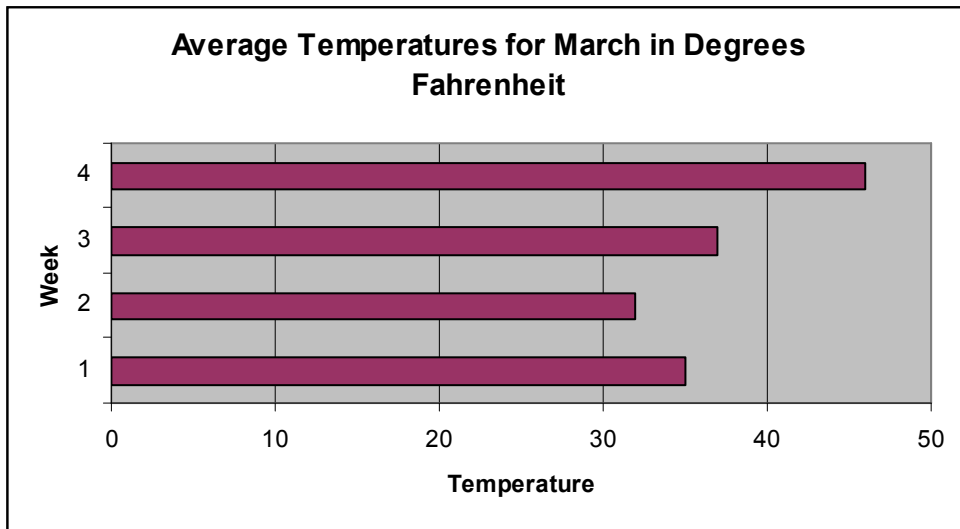
Bar graphs are used to compare things between different groups or to track changes over time. However, when trying to measure change over time, bar graphs are best when the changes are larger. You need the same "features" for a bar graph that you do for a line graph.

Average Temperatures for March in Degrees Fahrenheit

Week	Average Temperature
1	35
2	32
3	37
4	46



Bar graphs can be vertical (as shown above) or horizontal (as shown below).

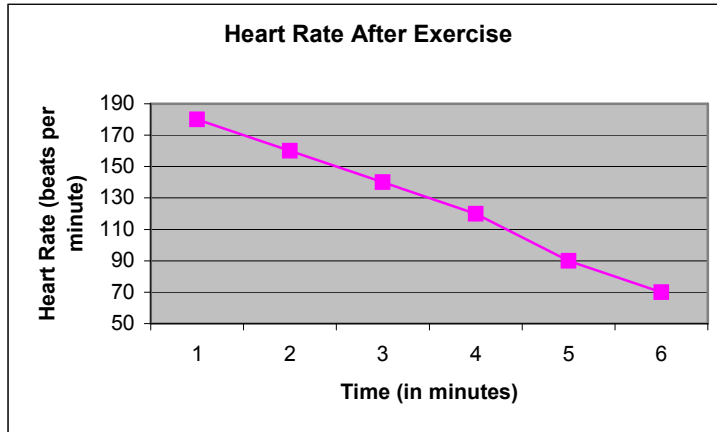


- **an X-Y Plot.**

X-Y plots are used to determine relationships between the two different things. The x-axis is used to measure one event (or variable) and the y-axis is used to measure the other. If both variables increase at the same time, they have a positive relationship. If one variable decreases while the other increases, they have a negative relationship. Sometimes the variables don't follow any pattern and have no relationship. We will use a modified X-Y Plot when we do the EKG lab. You need the same "features" for a X-Y plot that you do for a line graph.

Heart Rate After Exercise

Time (beats per minute)	Heart Rate (in minutes)
1	180
2	160
3	140
4	120
5	90
6	70



Graphs and charts are great because they communicate information visually. For this reason, graphs are often used in newspapers, magazines and businesses around the world.

*This information was taken from <http://nces.ed.gov/nceskids/createagraph/>

** Data for graph was taken from <http://sps.k12.ar.us/massengale/graph%20examples.htm>

Graphing

Graph 1

Prevalence of Diabetes Mellitus from 1988 to 1994 in the United States

Year	Number of Cases (in thousands)
1988	6162
1989	6467
1990	6212
1991	7206
1992	7365
1993	7783
1994	7744

NOTE: Not all graphs need to have the X-axis and/or Y-axis start at 0.

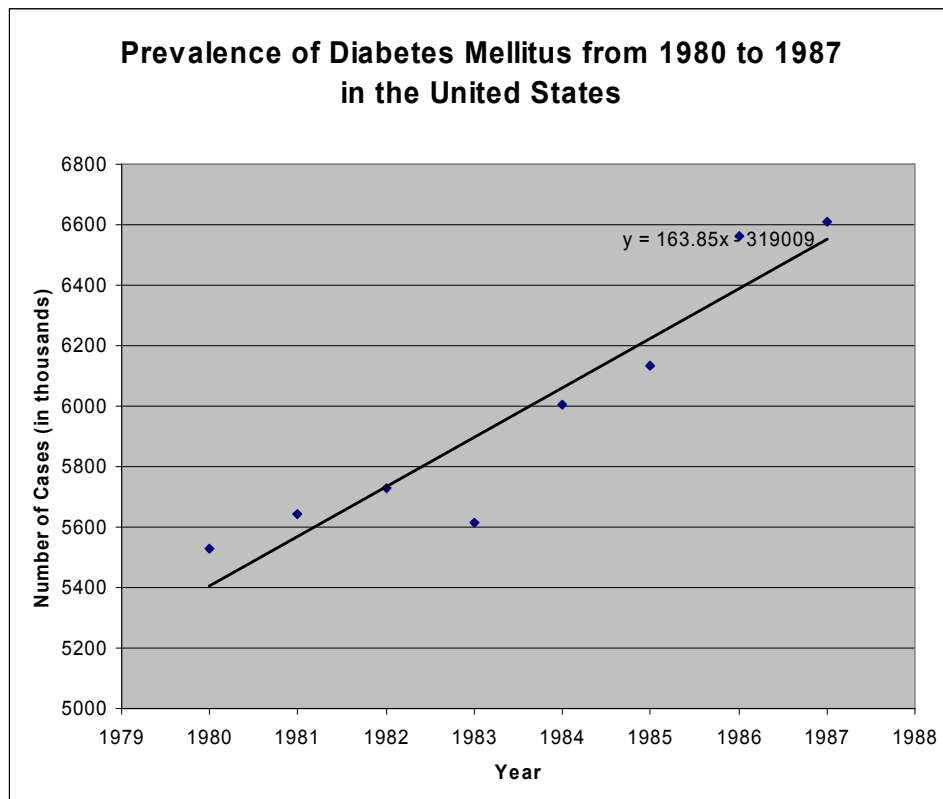
NOTE: Graphs can be drawn “horizontal” instead of “vertical”.

Let's take this one step further. **(You will not need to calculate the slope of a line for your graphs in class. Nor will you be required extrapolate data by using the slope of a line for the graph.)**

Graph 2:

Prevalence of Diabetes Mellitus from 1980 to 1987 in the United States

Year	Number of Cases (in thousands)
1980	5528
1981	5645
1982	5729
1983	5613
1984	6004
1985	6134
1986	6563
1987	6609
1988	6162



In this case “y” is the number of cases (in thousands). If you want to calculate the possible number of cases in the future you will need to solve for “y” using the slope of the line. In this case the slope is:

$$y = 163.85x - 319009$$

“x” is the year

Using the “Prevalence of Diabetes Mellitus from 1980 to 1987 in the United States” graph, **(This is what I mean by extrapolating data by using the slope of a line for the graph.**

1. calculate how many cases of diabetes mellitus (in thousands) there will be in the United States in

1995 _____

1998 _____

2000 _____

2003 _____

2005 _____

2. In what year will the number of cases of diabetes mellitus (in thousands) in the United States reach 12,500 cases?
3. Based on THIS chart, there should be _____ cases of diabetes mellitus (in thousands) in the United States in 1988.
4. How many cases were actually recorded in 1988? _____
(NOTE: See “Prevalence of Diabetes Mellitus from 1988 to 1994 in the United States” above.)

Data on diabetes mellitus was obtained from CDC (1997, October 31) Trends in the Prevalence and Incidence of Self-Reported Diabetes Mellitus – United States, 1980-1994. Retrieved May 26, 2003, from <http://www.cdc.gov/mmwr/preview/mmwrhtml/00049741.htm>

You will NOT need to be able to calculate the slope of a line on a graph.