Worksheet: Graphing Skills

Name _____
Date _____
Period _____ Table _____

The three common graphs that you will use this year are pie, bar, and line graphs. The bar and pie graphs will mainly be used for interpretation purposes. The data that you will graph this year will be plotted in a line graph format. This will include both straight line and curved line graphing.

Pie Graphs	Bar Graphs	Line Graphs
• Dependent variable is NOT continuous • Usually presents data as a "part of a whole" or as percentages	• Dependent variable is NOT continuous • There is no order to the categories on the X-axis • Bars typically don't touch • Y-axis is usually a percentage or a frequency (count)	• Dependent variable IS continuous • Points are plotted using x- and y-components • The points are connected because the observations are NOT independent (the next value depends on the previous value)

Based on these definitions, and the descriptions of the experiments below, please put an "X" in the box for the type of graph that would be *most* appropriate.

#	Description of Data to Be Graphed	Pie	Bar	Line
1	Amount of each color of M&M's in a bag			
2	Heating a pan of water over a time period			
3	Measuring the amount of each gas in air			
4	Shows the percentage of class earning ABC's			
5	Shows height change over 15 year period			
6	How allowance is spent on different things			

When labeling your axes, keep 3 things in mind:
° The independent (run) variable is written along the horizontal axis (X axis)
° Dependent (rise) variable is written along the vertical axis (Y axis)
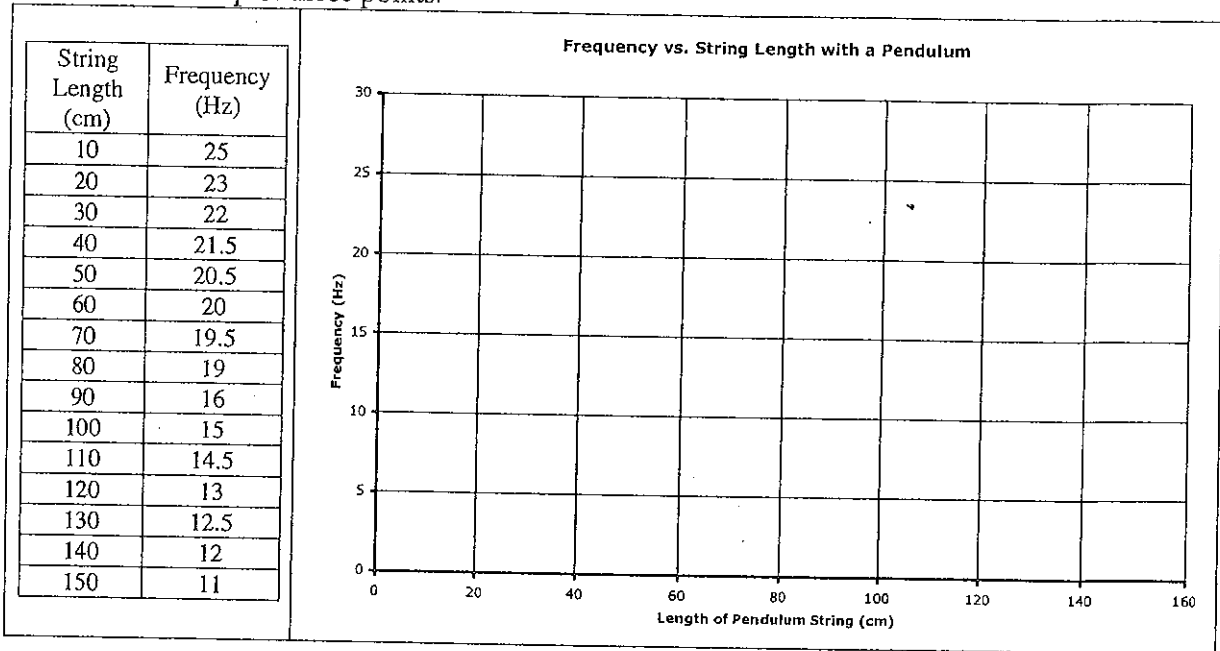° Units on any variables should be included in parentheses ( ) following the axis title

For each experiment described below, **label** the independent and dependent variable on the appropriate axis. Be sure to include units when appropriate.

Graph 1: A ball is dropped from several distances above the floor (in meters) and the height it bounces is then measured (in centimeters).	Graph 2: A candle was burned under glass jars of different volumes (in ml) to see if the volume of the jar affects the length of time (in seconds) the candle burns.

Plotting points can be easy if you follow these simple steps:
- Step 1: Select the first pair of values from the data table (X and Y).
- Step 2: Draw a light dashed line up from the number on the X axis and over from the number on Y axis. (Once you get good at plotting points, you won't need to draw these lines anymore.)
- Step 3: Where these dotted lines cross, put an "X" or a dark point. Repeat for the next pair of points.

Practice: Please plot these points.

String Length (cm)	Frequency (Hz)
10	25
20	23
30	22
40	21.5
50	20.5
60	20
70	19.5
80	19
90	16
100	15
110	14.5
120	13
130	12.5
140	12
150	11

Frequency vs. String Length with a Pendulum

Frequency (Hz) / Length of Pendulum String (cm)

With plots it is important to put a best-fit line or curve through points where relationships exist.
- Do you notice a pattern or trend in the data?
- If so, draw a straight line or curve that represents that trend.
- All points should lie on or very near the line
- For points not on the line, about half should be above the line and half below the line
  - The sum of the distance between the line and all points above should approximate the sum of the distance between the line and all points below (residual values)

In the above graph (frequency vs. String Length), **draw** the best line for the plot points.

Each of the scales for the *dependent* variables has a few missing values on it. Please fill in any missing values.

Please fill in missing values for the *independent* variables. (0 to 28)

A)
6
5
3
1
0

B)
25
20
10
5
C

C)
24
0