



## Graphing and Analyzing Scientific Data

Graphing is an important procedure used by scientist to display the data that is collected during a controlled experiment. There are three main types of graphs:

Pie/circle graphs: Used to show parts of a whole.

Bar graphs: Used to compare amounts.

Line graphs: Use to show the change of one piece of information as it relates to another change.



Both bar and line graphs have an “X” axis (horizontal) and a “Y” axis (vertical).

### Parts of a Graph:

Title: Summarizes information being represented in ANY graph.

Independent Variable: The variable that is controlled by the experimenter, such as, time, dates, depth, and temperature. This is placed on the X axis.

Dependent Variable: The variable that is directly affected by the I.V. It is the result of what happens as time, dates, depth and temperature are changed. This is placed on the Y axis.

Scales for each Variable: In constructing a graph, one needs to know where to plot the points representing the data. In order to do this a scale must be employed to include all the data points. This must also take up a conservative amount of space. It is not suggested to have a run on scale making the graph too hard to manage. The scales should start with 0 and climb in intervals such as, multiples of 2, 5, 10, 20, 25, etc...the scale of numbers will be determined by your data values.

Legend: A short descriptive narrative concerning the graph's data. It should be short and concise and placed under the graph.

For any set of data, you will need to determine the following:

Mean: This is determined by adding all the numbers in a set of data and then dividing by the number of values.

Median\*: This is the middle number in a set of data. If there is an even set of numbers in the data, then take the average of the two middle numbers.

Ex: 2, 3, 4, 8, 12, 16, 20 median = 8

Ex: 3, 5, 8, 11, 17, 19, 27, 30 median is  $11 + 17 = 28/2 = 14$

Mode\*: This is the number that occurs most often in a set of data.

Ex: 3, 4, 6, 6, 7, 9,9,9, 12, 12, 15 mode = 9

\* To determine median and mode, the numbers in the set of data must be put in numerical order.

Extrapolate: extending the graph, along the same slope, above or below measured data.

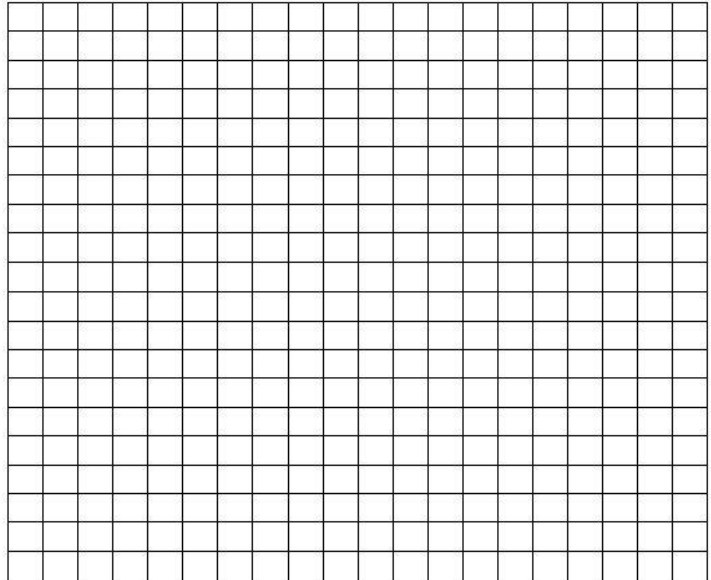
Interpolate: predicting data between two measured points on the graph

**Graph Worksheet**  
**Graphing & Intro to Science**

Name: \_\_\_\_\_

A. Graph the following information in a **BAR graph**. Label and number the x and y-axis appropriately.

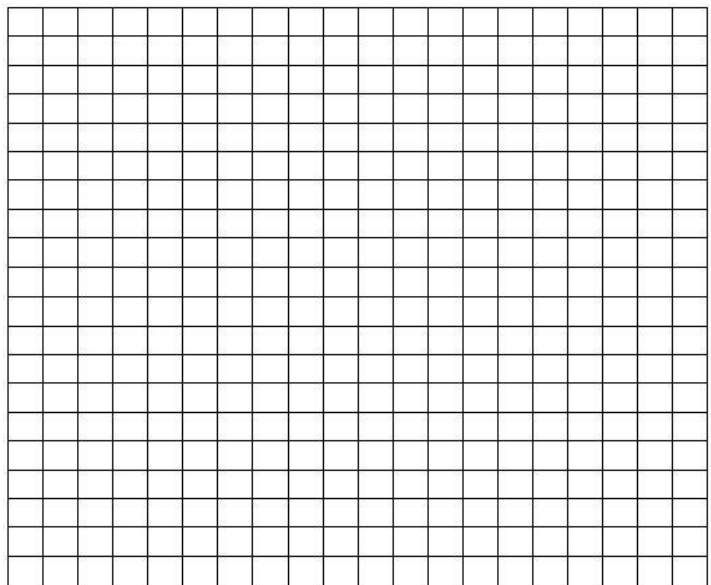
Month	# of deer
Sept	38
Oct	32
Nov	26
Dec	20
Jan	15
Feb	12



1. What is the independent variable? \_\_\_\_\_
2. What is the dependent variable? \_\_\_\_\_
3. What is an appropriate title? \_\_\_\_\_
4. What is the average number of deer per month? \_\_\_\_\_

B. Graph the following information in a **LINE graph**. Label and number the x and y-axis appropriately.

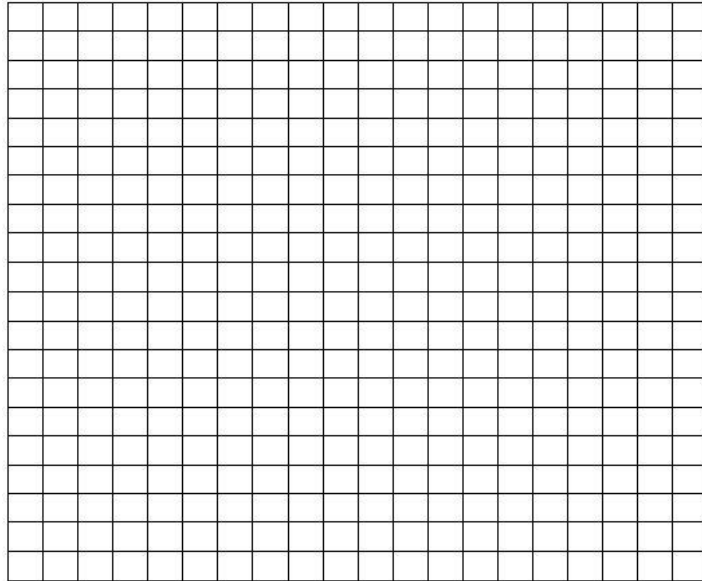
# of Days	# of Bacteria
1	4
2	16
3	40
4	80
5	100
6	200



1. What is the independent variable? \_\_\_\_\_
2. What is the dependent variable? \_\_\_\_\_
3. What is an appropriate title? \_\_\_\_\_

C. Graph the following information in a **BAR graph**. Label and number the x and y-axis appropriately.

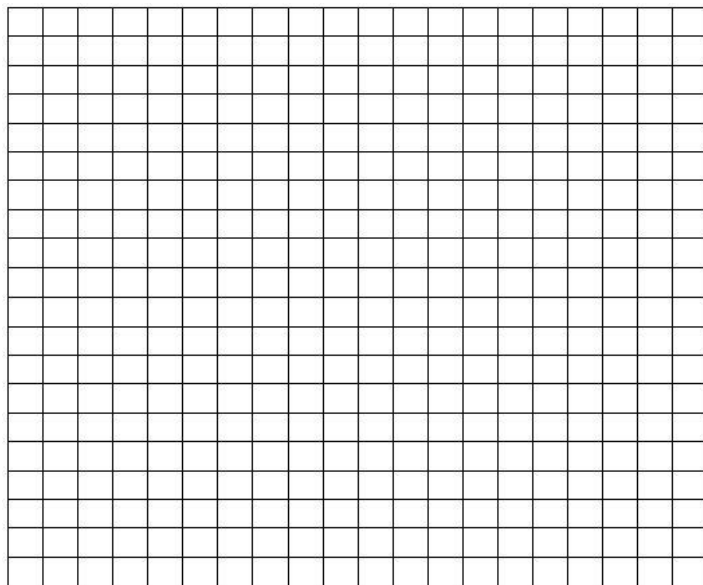
# of Hours of Study	Grade
0	20
2	60
4	70
6	80
8	90
10	100



1. What is the independent variable? \_\_\_\_\_
2. What is the dependent variable? \_\_\_\_\_
3. What is an appropriate title? \_\_\_\_\_
4. What was the average grade earned? \_\_\_\_\_

D. Graph the following information in a **LINE graph**. Label and number the x and y-axis appropriately.

Temperature	Enzyme Activity
0	0
20	10
30	15
40	20
50	8
60	5
70	0



1. What is the independent variable? \_\_\_\_\_
2. What is the dependent variable? \_\_\_\_\_
3. What is an appropriate title? \_\_\_\_\_