

Name: _____ Date Completed: _____
Class: _____ Lab Minutes: _____ Teacher: _____

Graphing Activities

This lab was created by Mr. Buckley from Edward Knox High School. Credit is given for this original activity to Mr. Buckley.

Introduction

Graphing is used by scientists to display the data that is collected during a controlled experiment. A line graph must be constructed to accurately depict the data collected. An incorrect graph often leads to the acceptance of an incorrect hypothesis or detract from the acceptance of a correct hypothesis.

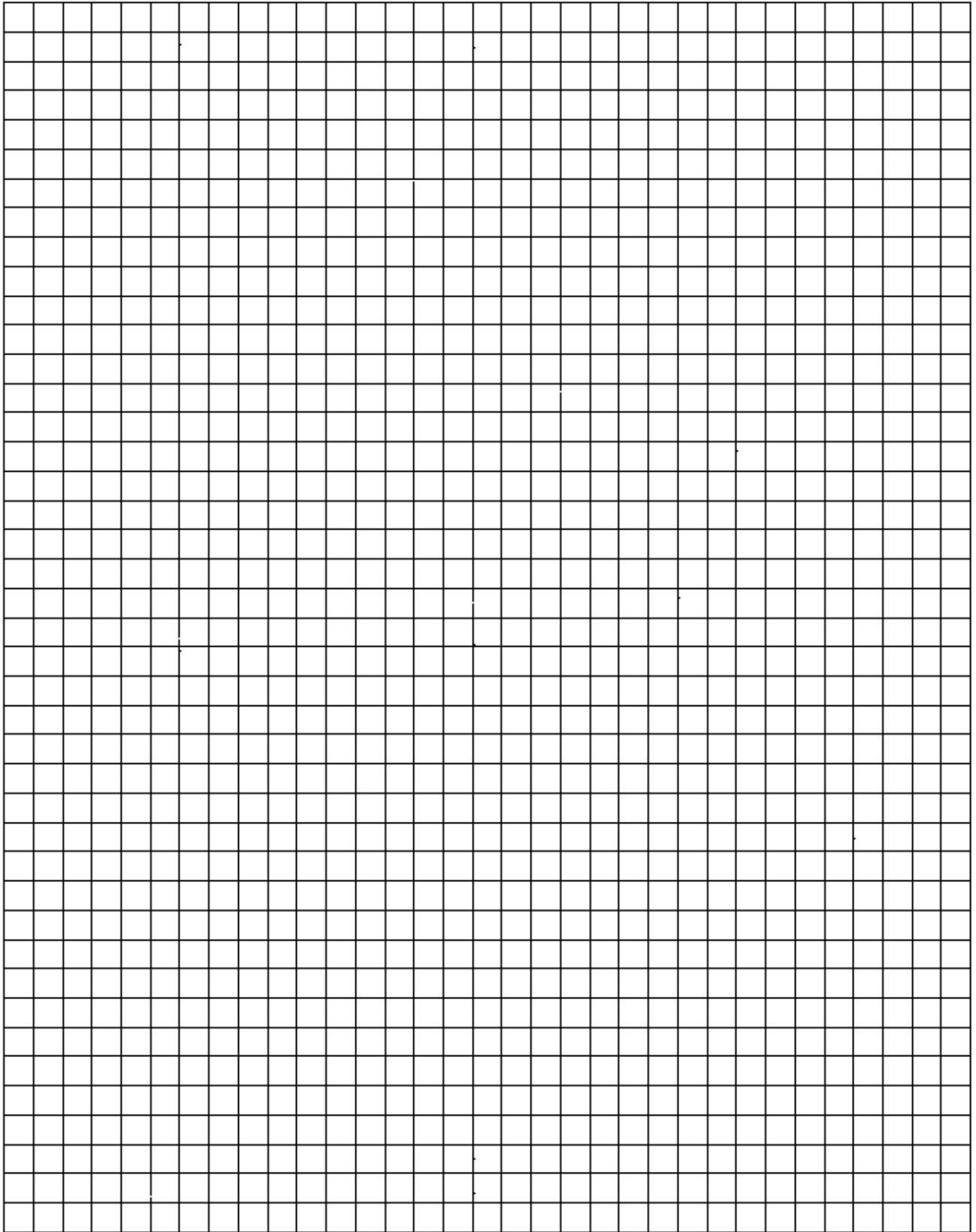
The graph should contain 5 major parts: the title, the independent variable, the dependent variable, the scales for each variable, and a legend.

- 1.) **The title:** this shows what the graph is about. Reading the title should give the reader an idea about the graph. It should be a concise statement placed above the graph.
- 2.) **The Independent Variable:** this is the variable (part of the experiment that changes) that can be controlled or manipulated by the experimenter. This variable should be placed on the horizontal or x-axis.
- 3.) **The Dependent Variable:** this is the variable directly affected by the independent variable. It is the result of what happens because of the independent variable. This variable is placed on the y or vertical axis.
- 4.) **The 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 that will include all the data points. Each block should have a consistent amount or increment on a particular axis. While the scale should allow as much of the graph to be taken up as possible, it is not a good idea to set up a scale that is hard to manage. For example, multiples of 5, 10, etc. are good, while multiples such as 1.22 are not! Your scale must be plotted on the amount of graph space available, and will be dictated by the data points.
- 5.) **The Legend:** this is a short descriptive narrative concerning the graph's data. It should be short and to the point and placed directly under the graph.

Graphing Activity # 1

1. Use the data in the table below to complete the graph provided. Remember to title your graph, label the axes properly when setting up your scale, make a key, and to write a legend for your graph when completed.

Depth in meters	Number of bubbles/min Plant A	Number of Bubbles/min Plant B
2	29	21
5	36	27
10	45	40
16	32	50
25	20	34
30	10	20



Legend: _____

Answer the following questions based on the graph above you just completed.

1. What is the independent variable? _____

2. Why is this the independent variable? _____

3. What is the dependent variable? _____

4. Why is this the dependent variable? _____

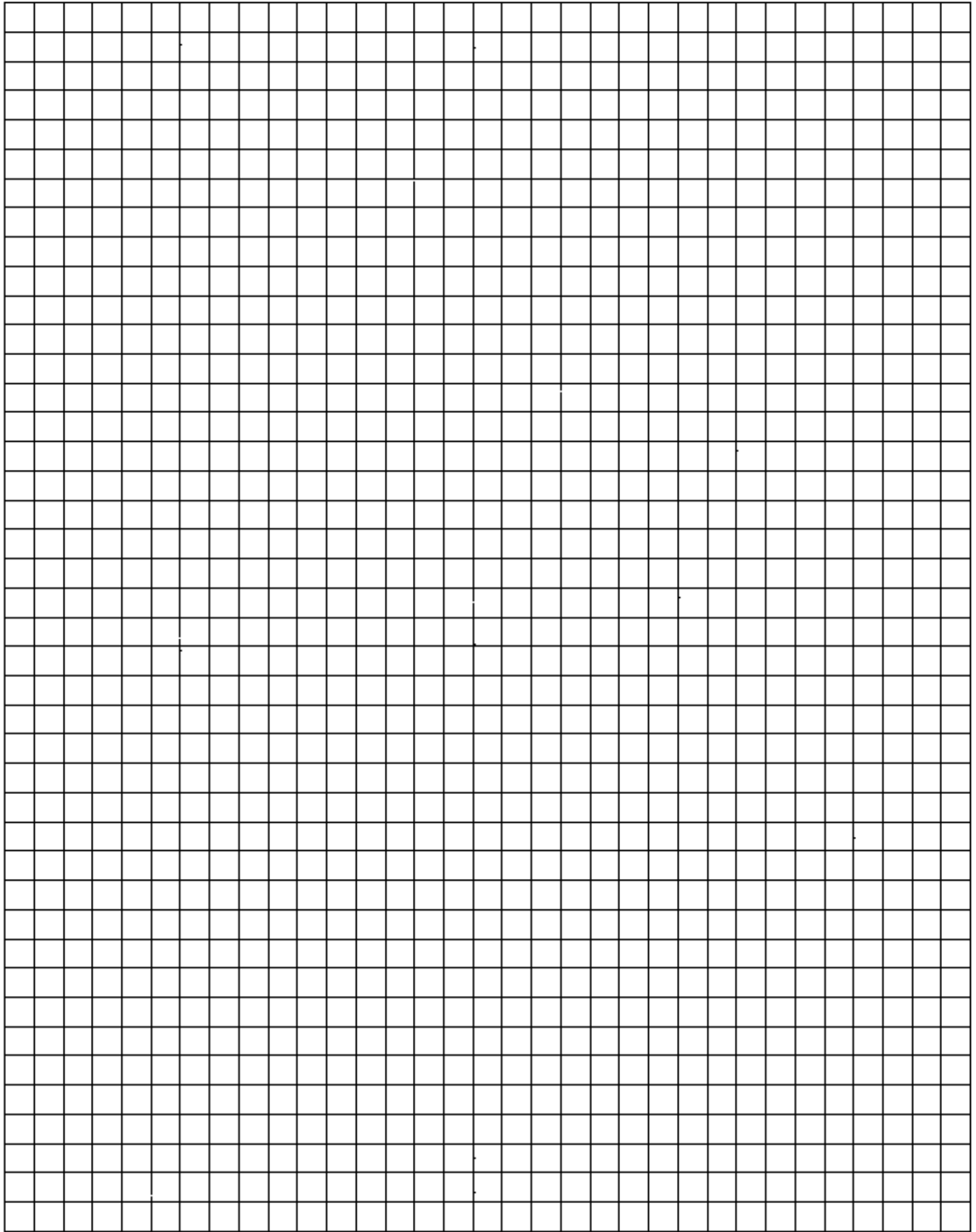
5. Use one or more complete sentences to state a conclusion about the data in graph # 1.

Graphing Activity # 2

Diabetes is a disease affecting the insulin producing glands of the pancreas. If there is not enough insulin being produced by the cells, the amount of glucose in the blood will remain high. A blood glucose level above 140 for an extended period of time is not considered normal. This disease, if not brought under control, will lead to severe complications and even death.

1. Use the data in the table below to complete the graph provided. Remember to title your graph, label the axes properly when setting up your scale, make a key, and to write a legend for your graph when completed.

<u>Time After Eating (hrs.)</u>	<u>Glucose Level in ml/liter of blood in person A</u>	<u>Glucose Level in ml/liter of blood in person B</u>
0.5	170	180
1	155	195
1.5	140	230
2	135	245
2.5	140	235
3	135	225
4	130	200



Legend: _____

Answer the following questions based on the graph above you just completed.

1. What is the independent variable? _____

2. Why is this the independent variable? _____

3. What is the dependent variable? _____

4. Why is this the dependent variable? _____

5. Which, if any of the above individuals has diabetes? Be sure to justify your answer!

6. If the time period were extended to 6 hours, what would be the expected blood sugar level for Person B? _____

7. What would be a probable blood sugar level for person B at 3.5 hours? _____

8. Use one or more complete sentences to state a conclusion about the data in graph # 2.

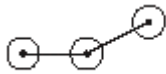
Graphing Activities Homework

The data table shows water temperatures at various depths in an ocean.

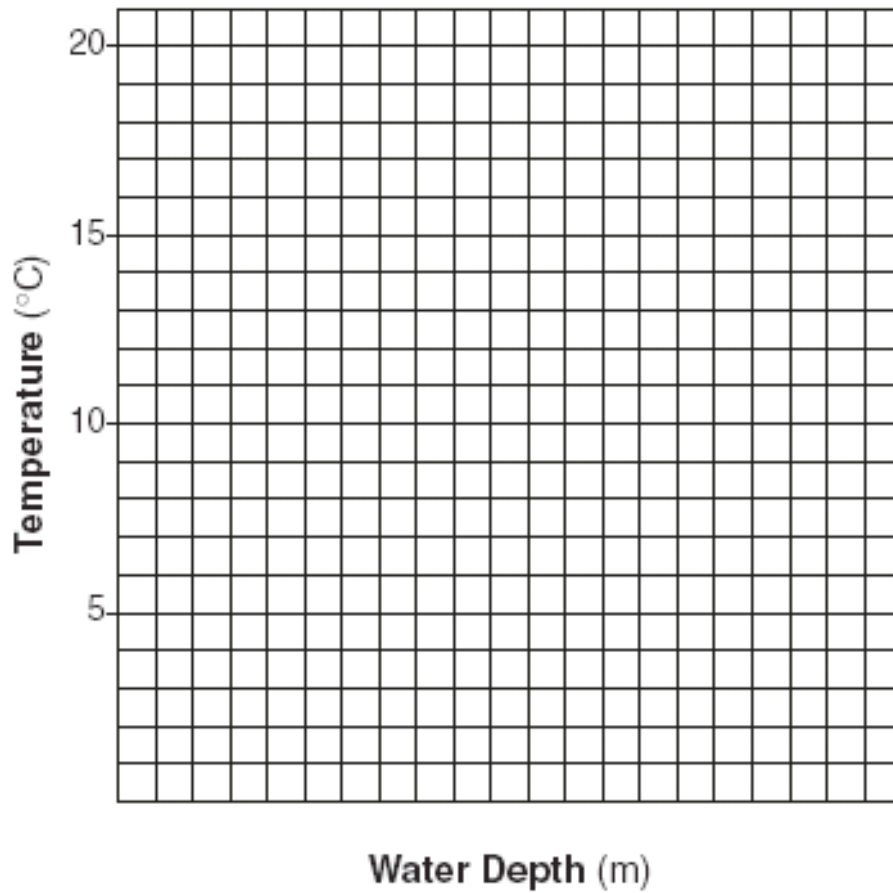
Water Depth (meters)	Temperature (°C)
50	18
75	15
100	12
150	5
200	4

Using the information in the data table, construct a line graph on the grid, following the directions below:

- Create a title for the graph. Write the title at the top of the graph.
- Mark an appropriate scale on the axis labeled "Water Depth (m)."
- Plot the data on the grid. Surround each point with a small circle and connect the points.



Example:



Problems Based on Graphing Set One

1. Using a complete sentence, state the general relationship between temperature and water depth.
Example: As the water depth increases/decreases, the temperature increases/decreases.

2. The approximate water temperature at a depth of 125 meters would be closest to:
(1) 15°C (2) 8°C (3) 13°C (4) 3°C

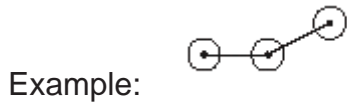
A student counted the total number of leaves in a group of duckweed plants over a 5-day period. The data collected are shown in the table below.

Growth of Duckweed Leaves

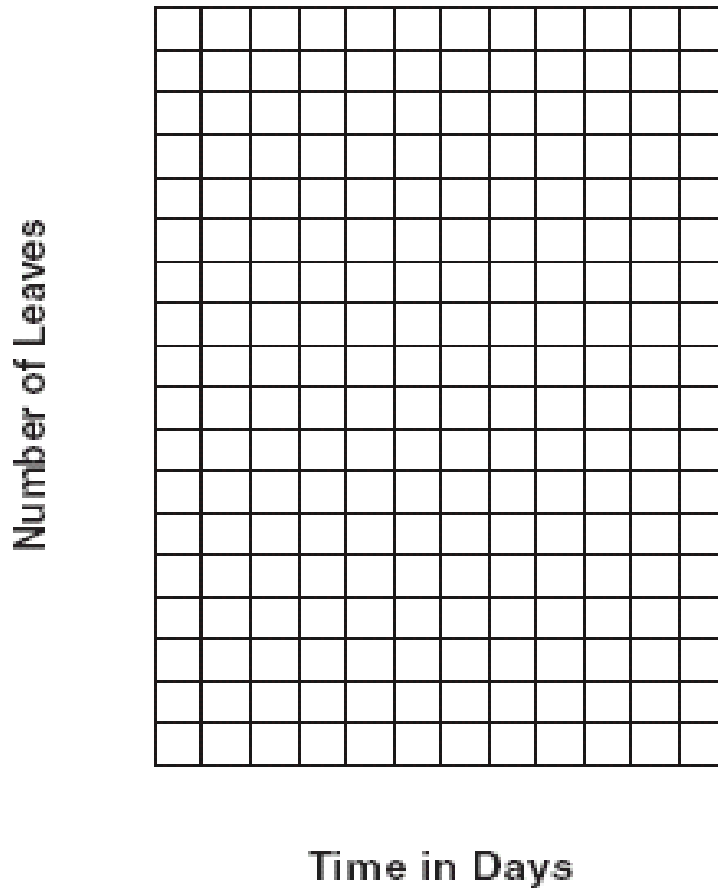
Time in Days	Number of Leaves
0	15
1	20
2	25
3	40
4	60
5	80

Using the information in the data table, construct a line graph on the grid provided following the directions below.

- Mark an appropriate scale on each labeled axis.
- Plot the data from the data table. Surround each point with a small circle and connect the points.



Growth of Duckweed Leaves



Problems Based on Graphing Set Two

1. The time it takes for the number of leaves to increase from 15 to 30 is approximately
(1) 2.0 days (2) 2.3 days (3) 2.9 days (4) 3.2 days
2. Using a complete sentence, state what would most likely happen to the production of oxygen by duckweed plants if the intensity and duration of exposure to light were increased.
