Mathematics 20-3 **Name:** _____
Unit 5 Project – Recording and Representing Data

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You task is to gather experimental data, organize it, and then represent it using the proper graph type.

YOU will decide what experiment to do, choosing from the following suggestions, or coming up with your own. Although we will have some time during class, most of this project work will have to be done on your own.

Graph Requirements

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 axis of the graph, and a Legend.

1.) **The Title:** this tells what the graph is about. Reading the title should give a clear idea about the graph. It should be a concise statement placed above the graph. "Graph About Balls" is neither descriptive, nor sufficient.

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. You should try to create a a scale that allows for most or all of the graph space to be taken up by your data. Choose reasonable numbers.

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.

Evaluation

1. Properly labelled and filled in **Data Table**. [5 Marks]

2. Properly labelled and compelted **Graph**. [10 Marks]

3. Bonus multiplier: 1.1 for your own, appropriate experiment idea

Complete a Data Table and I will provide Graph Paper.

Experiment Ideas

You MAY use one of these ideas, or come up with your own experiment.

1. Measure and compare head circumference with height. (n=15, at least fifteen people measured.)

2. Measure and compare distance between outstretched hands (ginger tip to finger tip) vs height. (n=15, at least fifteen people measured.)

3. Record how many bounces different balls make, from different heights (n=3, at least three different balls measured at different heights.)

4. Measure the relationship between the distance around a circular object and the distance across the base of the object. (n=20, at least 20 different objects measured.)

5. Measure the thickness of different kinds of paper for different number of pages. (n=3, at least three different kinds of paper, with as many different page counts as practical.)

6. Measure and compare the rates at which different faucets in your home flow. (n=15, at least three different faucets and 10 different volumes.)

7. Measure the period of a pendulum with different weights (n=5, at least 5 different weights.)

8. Measure the period of a pendulum with different lengths of string. (n=5, at least.)

9. Measure the period of a pendulum with different types of string.

10. Measure the time it takes for objects (balls, cylinders) to roll down an inclined plane of different slopes. (n=10, at least 10 different objects with three different slopes.)

11. Measure the falling speed of different sized paper helicopters, from different heights (at least three different helos, five different heights).

12. Compare the number of words and the number of letters per line of hardcover books, paperback books, magazines, and newspapers.

13. Compare the distances that people (n=5, at least) can hop on their left and right feet after 10, 20, 30, 40, 50, and 60 seconds).

14. Compare the time that people (n=5, at least) take to hop on their left and right feet after 10, 20, 30, 40, and 50m.

15. Measure the reaction time (by distance) of dropping and grabbing a meter stick, by at least n=10 students, and with at least n=5 different weights attached to the bottom.