

Mass vs. Weight [NOTEBOOK LAB]

Purpose

In this experiment, students will use a force sensor to discover the relationship between an object's weight and its mass.

Equipment

- Force Sensor
- Mass Hanger
- Computer Interface
- Masses

Procedure

1. Attach the Force Sensor to the interface box
2. Open up the Capstone Software, choose your interface, and select the probe "Force Sensor, Economy" in the correct port, close the hardware setup screen.
3. Select 2 large and 1 small display in the main window. In the top left place digits (Force), on the bottom left select table, in the right pain choose graph.
4. In the data table click on "Select Measurement Column 1", Click on "Create New" and the "User Entered Data." Call this data "Mass." Change the Units to "kg"
5. Label Column 2 of the data table "Weight" The units are "N"
6. On the graph change the y axis to User Entered Data "Weight". Change the x Axis to User Entered Data "Mass".
7. Click the record button. Don't stop recording until all of the data is collected.
8. Take a mass and place it on the digital balance. Record the value in the capstone table row 1 under mass.
9. Hold the force sensor with the hook straight down. Without moving the force sensor push the "tare" button on the front of the force sensor.
10. Hang the mass measured in step 8 on the force sensor and record the weight of the object in row 1 of the data table under "weight".
11. Repeat steps 8 through 10 with 4 additional masses.
12. In the graph, right click on the legend and unselect "Show Legend"
13. Click on one of the data points on the graph, and then from the tool bar under graphs choose linear.
14. Format the sheet with titles and other required information.
15. Print the sheet.

Questions

1. In general, what pattern do you notice between weight of an object and its mass?
2. What do the y, m, and x represent in the line equation?
3. Using this equation, what would be the weight of an object with a mass of 55.2 kg?
4. What would happen to the weight and mass of an object, if it were taken to our Moon? Explain.

Questions/Things you need to do individually:

Purpose (2pt)

Include

Data (5pt)

Write the data table into your lab notebook with the correct values in MKS and measured to the precise value.

Graphs (5pt)

Hand draw an approximate graph in your notebook

Results (5pt)

State the results of the lab. Explain what the results are showing.

Answer the questions above (8pt)

State the results of the lab. Explain what the results are showing.