Experimenting with the Force Plate - using Logger Lite [1]

Introduction:

Imagine stacking several copies of the same book. How will the weight of one of those books compare with two, three, or four books? In this experiment we will this question.

Data Collection:

(1) Plug the Force Plate into the Go! Link cable and connect the cable into a USB port.
(2) Open Logger Lite. Notice a Table appears with columns for Force (measured in Newtons) and Time. A graph of Force versus Time should also appear on the screen.
(3) Press the Zero key to zero the Force Plate.
(4) Press Collect.
(5) Place one book, another, a third book, and then a fourth book onto the Force Plate.
(6) Choose Export As from the File menu.
(7) Open the file in Fathom.

Questions

1. Describe the relationship between Force and Time
2. How does the graph that you created compare to the graph of another student?
3. Can you determine from the graph when a book was placed on the force plate?
4. Graph a function on the graph that models the Force of 1 book.
5. Graph a function on the graph that models the Force of 2 books.
6. If you repeat the experiment will you obtain the same graph? Explain.
7. What would happen if the books that were placed on the Force Plate were of different weights?

Extension:

What if we tried to continuously add force to the Force Plate rather than add a discrete number of books? How would that change the appearance of the graph?

Data Collection:

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[1] http://www.vernier.com/files/sample_labs/PWV-30-COMP-newtons_law_cooling.pdf

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(2) Open Logger Lite. Notice a Table appears with columns for Force (measured in Newtons) and Time. A graph of Force versus Time should also appear on the screen.
(3) Press the Zero key to zero the Force Plate.
(4) Press Collect.
(5) Fill several cups with rice and place a large empty container on the Force Plate. Add one cup of rice and examine the graph.
(6) Add two cups, three, or four cups of rice.

Questions

1. Describe the relationship between Force and Time
2. How does adding rice differ from adding books? Explain.
3. What happened when more rice was added? Why?
4. You may notice some "noise" in the data. What might account for the noise?