

Move Your Mass Final Lab and Report

Physics

For this lab report, make sure to clearly show all equations, variables, measurements and calculations you used. It should be easy to identify what each number on your report means and where it came from. (Units are necessary for identifying initial measurements and final answers but are not necessary for calculations.) This report is an individual assignment.

Recalculate the friction acting on the cart using the method you used in the preliminary lab. This time, make sure to use at least two bars on top of the cart, and use an empty hanging mass (50 grams). After you have calculated friction, predict the acceleration of the cart if you were to place an additional 50 grams on a 50 gram hanging mass (for a total of 100 grams) – leave the cart exactly as it was when you calculated the force of friction. Then, test your prediction using the cart and motion sensor. As you carry out the lab, answer the following questions:

1. What was the force of friction you calculated to be acting on the cart? Make sure to fully document your measurements and calculations.
2. What was your predicted acceleration for the cart with 100 grams of hanging mass? Again, make sure to fully document your calculations. Include free-body diagrams and show all your equations.
3. What was the actual acceleration you measured with 100 grams of hanging mass (via calculations using the Big 4) using the motion sensor?
4. How did your predicted acceleration compare to your calculated acceleration? Briefly (in 1-2 thoughtful paragraphs) discuss the reasons your prediction and your measured accelerations might differ from each other. Include your ideas about possible sources of error in your measurements and calculations.