

Momentum & Impulse Lab

Date:_____ Period:_____ Group Number:_____ Name:_____

Names of other group members present:

Include your name, date, group number, and class period at the top of each sheet of work in your lab report. Include the names of the other members of your lab group who were present for data collection.

Keep a reference copy of your work as a study guide.

1. Measure the mass of your cart and each brick.
2. Run a timer tape for the spring launch of an empty cart, a cart loaded with one brick, and a cart loaded with two bricks.
3. Measure and tabulate the total elapsed time for the whole acceleration period for each cart loading (empty, one brick, and two bricks). Include steps 3, 4, & 5 in a single table.
4. Measure and tabulate the displacement intervals representing the acceleration of the cart in each case. Include the results of steps 3, 4, & 5 in a single data table.
5. Divide each interval displacement by one interval time to calculate and tabulate the average velocity for each interval of the acceleration. Include the results of steps 3, 4, & 5 in a single data table.
6. Graph the velocity of the cart versus elapsed time for the acceleration period for each loading (empty, one brick, and two bricks). For each cart loading, draw a single line that fits the data well. Calculate the slopes of these linear approximations of the data. For comparison, put all data on a single graph, with proper labeling and identification.
7. Multiply the slope of each line by the mass of the matching cart and load ($\text{slope}_0 \text{ times mass}_0$, $\text{slope}_1 \text{ times mass}_1$, & $\text{slope}_2 \text{ times mass}_2$). Describe what these three calculated numbers represent and comment upon any observed or inferred relationship among them.
8. Multiply each of the results of part 7 by the matching total acceleration time tabulated in part 3 ($\#7_0 \times t_0$, $\#7_1 \times t_1$, and $\#7_2 \times t_2$). Describe what these three calculated numbers represent and comment upon any observed or inferred relationship among them.
9. Multiply the final velocity (at the end of the acceleration period) for each cart loading by the mass of each loading (including the cart mass; $v_0 \times m_0$, $v_1 \times m_1$, & $v_2 \times m_2$). Describe what these three calculated numbers represent and comment upon any observed or inferred relationship between these values and those calculated in part 8 above.
10. Collect the results of steps 7, 8, & 9 in a results table adjacent to your descriptions.