# Lab 8: Impulse and Momentum

Experiment for Physics 211/225 at CSU Fullerton.

## What You Need To Know:

## What You Need To Do:

### Part 1 – Impulse

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Rubber Band | Initial Velocity | Final Velocity | Average Force | Change in Time | Impulse by mΔv | Impulse by FΔt | % Diff |
| THIN |  |  |  |  |  |  |  |
| THICK |  |  |  |  |  |  |  |

Table 1 – Part 1 Data

Explain why the momentum was or was not conserved based on what was discussed in the intro to the lab.

### Part 2 – Conservation of Momentum

Table – Part 2 Data

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Cart #1** | | | **Cart #2** | | | **Total Momentum** | | **Kinetic Energy** | | | |
| Trial | Mass  (kg) | Initial Velocity  (m/s) | Final Velocity  (m/s) | Mass  (kg) | Initial Velocity  (m/s) | Final Velocity  (m/s) | Before  (kgm/s) | After  (kgm/s) | Before  () | After  () | KE loss  () |
| Elastic – Same Mass |  |  |  |  |  |  |  |  |  |  |  |
| Elastic – Diff Mass |  |  |  |  |  |  |  |  |  |  |  |
| Perfectly Inelastic |  |  |  |  |  |  |  |  |  |  |  |

### Elastic Collision – Same Mass

Explain your answers to the following in terms of what was discussed in the intro.

Was the momentum conserved for your *system* from before to after?

Was the momentum conserved for *Cart #1* from before to after?

Physically speaking, why is this collision considered to be elastic? Do your calculated values for the kinetic energies reflect this? Explain.

### Elastic Collision – Different Mass



Was the total momentum conserved for this collision? Is this consistent with what you read in the intro? Explain.



Physically speaking, why is this collision considered to be inelastic? Do your calculated values reflect this?

## Conclusion

Follow the lab report guide to write a conclusion on this lab.

Submit any excel or graphical analysis data your instructor requests along with your report.

Conclusion