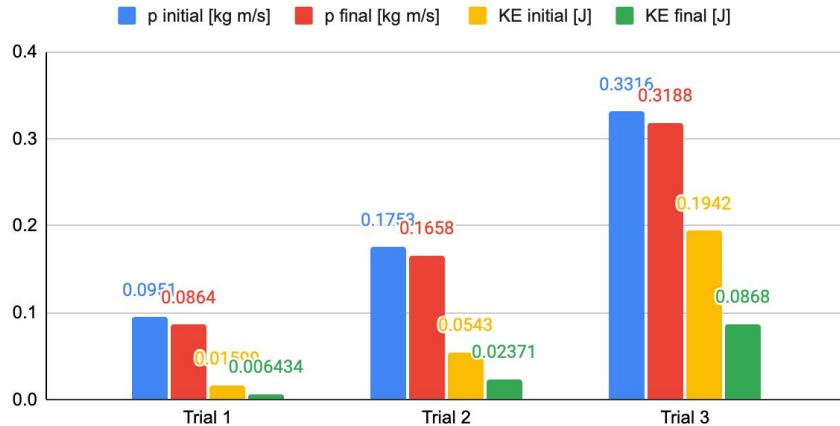


Test Description

Perform a perfectly inelastic collision between two carts on a frictionless track. Alter the velocity between trials. Use the formula for momentum and kinetic energy to confirm that momentum is conserved and kinetic energy is not.

Graph of Data

Comparison of Difference in Momentum (p) and KE in Inelastic Collisions



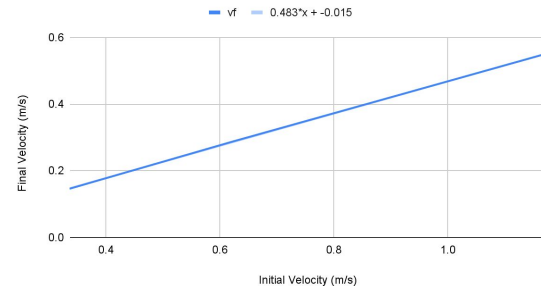
Data Table

V1 (m/s)	Vf (m/s)	Delta p	Delta KE
0.336	0.146	0.0106	0.0098
0.619	0.286	0.0095	0.0306
1.171	0.550	0.0128	0.1065

Conclusion

The difference in momentum between trials is roughly zero, showing that it's conserved. The difference in kinetic energy increases with the initial velocity, showing a direct relationship between velocity and loss of kinetic energy.

Ratio between initial and final velocity



Additionally, assuming that the change in momentum is zero, the equation of $m_1v_i = (m_1+m_2)v_f$ can be used to derive a ratio between the two velocities of $v_i = \frac{m_1}{(m_1+m_2)} v_f$. By graphing the relationship between the initial velocity and final velocity, the slope should be about 0.488.