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Pre-Lab 8
2/25/2021

Set $m_1 = 2\,kg$, $m_2 = 1kg$, $v_1 = 2m/s$, and $v_2 = -2\,m/s$ and observe the elastic collision of the 2 carts.

Read the values of the final velocities of the carts from the "Cart Velocity vs. Time Graph" graph and record them here.

Calculate total momentum of the system before and after collision and verify that it is conserved show your work.

- The final velocity of the green-colored cart with a mass of 2kg traveling at 2m/s is around -0.7 m/s.
- The final velocity of the aqua-colored cart with a mass of 1 kg traveling at -2m/s is around 3.4 m/s.

$$P_i = P_f$$

$$m_1 v_1 + m_2 v_2 = m_1 v_1' + m_2 v_2'$$

$$(2)(2) + (1)(-2) = (2)(-0.7) + (1)(3.4)$$

$$4 - 2 = -1.4 + 3.4$$

$$2 = 2$$

The total momentum of the system before and after collision is 2 kg · m/s. Momentum is conserved because of the momentum of the system before and after the collision is the same.