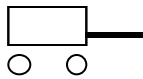
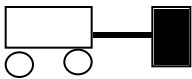
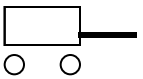
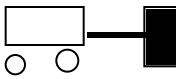
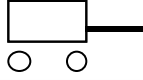
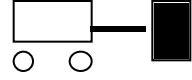
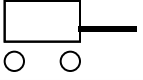
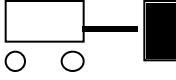
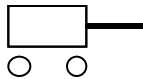
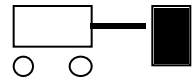
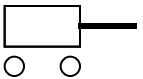
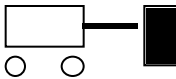


Bouncing Cart—Change in Momentum II⁷⁸

A cart with a spring plunger runs into a fixed barrier. The mass of the cart, its velocity just before impact with the barrier, and its velocity right after collision are given in each figure.

Rank the change in momentum for each cart from the greatest change in momentum to the least change in momentum (+ direction is to the right and - to the left with $-4 < -2$).

Before		After		Before		After
10 kg 	A	10 kg 		20 kg 	D	20 kg 
$v_o = 4 \text{ m/s}$		$v_f = 0 \text{ m/s}$		$v_o = 2 \text{ m/s}$		$v_f = 0 \text{ m/s}$
10 kg 	B	10 kg 		20 kg 	E	20 kg 
$v_o = 3 \text{ m/s}$		$v_f = -1 \text{ m/s}$		$v_o = 1 \text{ m/s}$		$v_f = -1 \text{ m/s}$
5 kg 	C	5 kg 		10 kg 	F	10 kg 
$v_o = 5 \text{ m/s}$		$v_f = -3 \text{ m/s}$		$v_o = 2 \text{ m/s}$		$v_f = -2 \text{ m/s}$

Greatest 1_____ 2_____ 3_____ 4_____ 5_____ 6_____ Least

Or, all the changes in momentum are the same. _____

Please carefully explain your reasoning.

How sure were you of your ranking? (circle one)

Basically Guessed

Sure

Very Sure

1 2 3 4 5 6 7 8 9 10

⁷⁸ T. O’Kuma