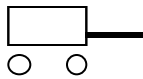
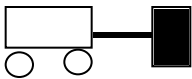
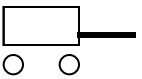
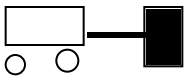
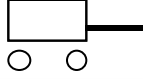
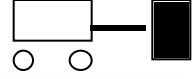
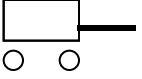
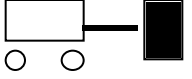
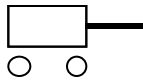
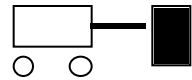
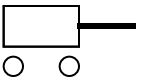
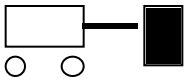


Bouncing Cart—Work Done by the Barrier ⁶¹

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 work done *by* the barrier on each cart from the greatest work done by the barrier to the least work done by the barrier (+ 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, the work done by the barriers is the same for all these cases. _____

Or, there is no work done by the barrier for all these cases. _____

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

⁶¹ T. O’Kuma, C. Hieggelke