Bouncing Cart—Change in Kinetic Energy [60]

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 kinetic energy for each cart from the greatest change in kinetic energy to the least change in kinetic energy (+ 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 m/s v_f = 0 m/s v_o = 2 m/s v_f = 0 m/s

10 kg **B** 10 kg 20 kg **E** 20 kg

v_o = 3 m/s v_f = -1 m/s v_o = 1 m/s v_f = -1 m/s

5 kg **C** 5 kg 10 kg **F** 10 kg

v_o = 5 m/s v_f = -3 m/s v_o = 2 m/s v_f = -2 m/s

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

Or, all the changes in kinetic energy are the same._____

Or, there is no change in kinetic energy 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

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