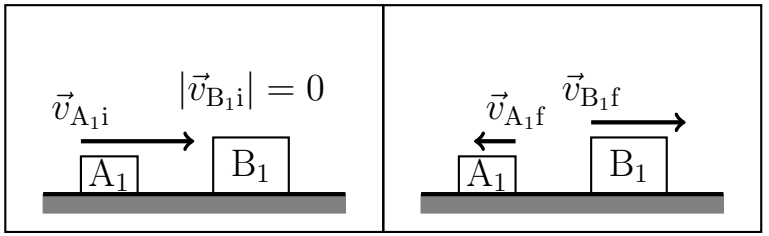
Lecture 21: Collisions

Prediction

- Experiment 1 is conducted with two carts, A_1 and B_1, on a level, frictionless track. The mass of cart B_1 is greater than that of cart A_1 (*i.e.* $m_{B_1} > m_{A_1}$).
- In experiment 1, cart A_1 moves toward cart B_1, which is initially at rest. Magnets are attached to the carts so that the carts repel each other without touching. After the collision, cart A_1 has reversed direction and cart B_1 moves to the right.
- *Predict* whether the magnitude of the final momentum of cart B_1 is *greater than*, *less than*, or *equal to* that of the system S_1 of both carts. Briefly explain.



Experiment 1

(A) Greater than

(B) Less than

(C) Equal to

(D) Not enough information

L21-1: Collision Experiments

L21-2: Carnival Game

Main Ideas

- Momentum and impulse are useful quantities for solving dynamics problems.
- The impulse is always equal to the change in momentum for a system.
- When the impulse is zero (because the net force is zero), the momentum of the system is constant—it is *conserved*.