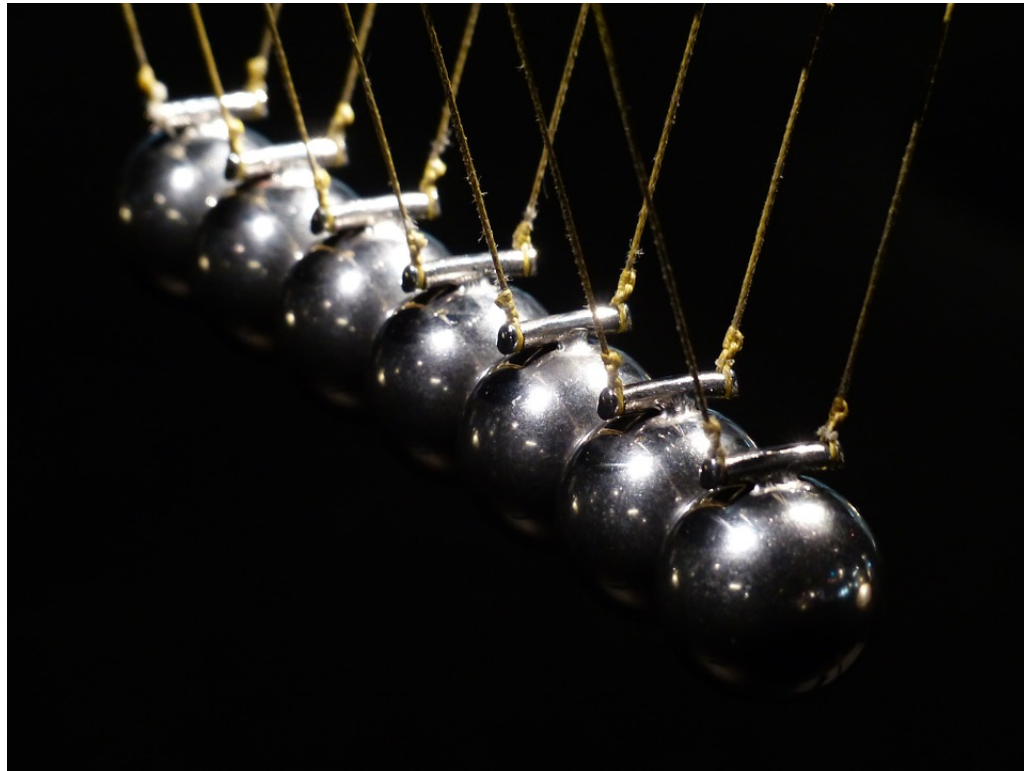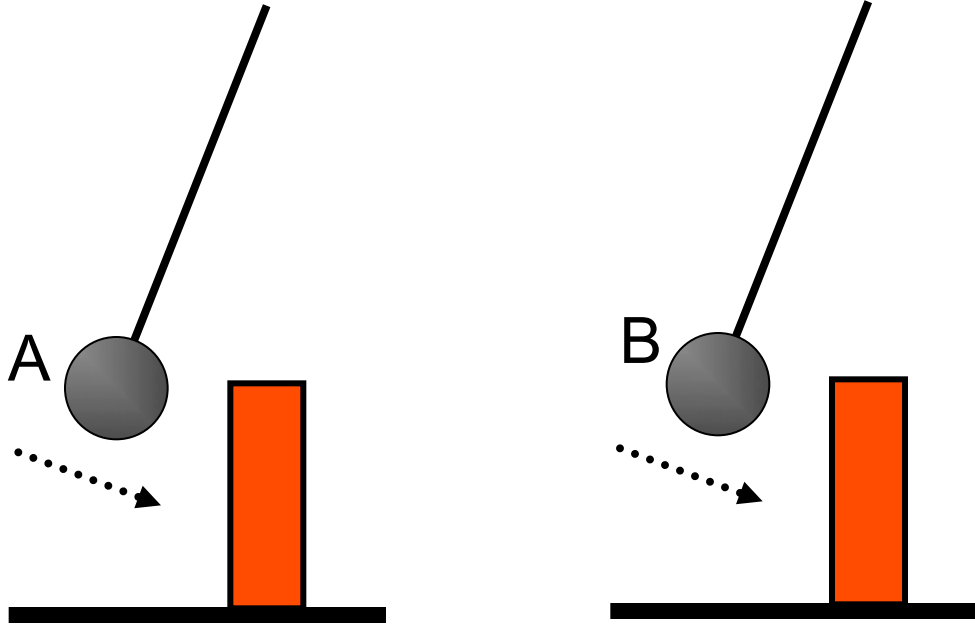# SAMPLE CLICKER-TYPE QUESTIONS

(MOMENTUM PHOTOPROJECT ACTIVITY)

by Rhys Adams (Vanier College)

Two equal-mass balls swing down and hit identical bricks while traveling at identical speeds. Ball A bounces back, but ball B just stops when it hits the brick. Which ball has a better chance of knocking the brick over?

A

B

1.   A

2.   B

3.   They both have the same chance.

You're on a cart, initially at rest, throwing balls at a partition that is rigidly mounted on the front of the cart. If the balls bounce straight back, as in the figure, then is the cart put in motion?
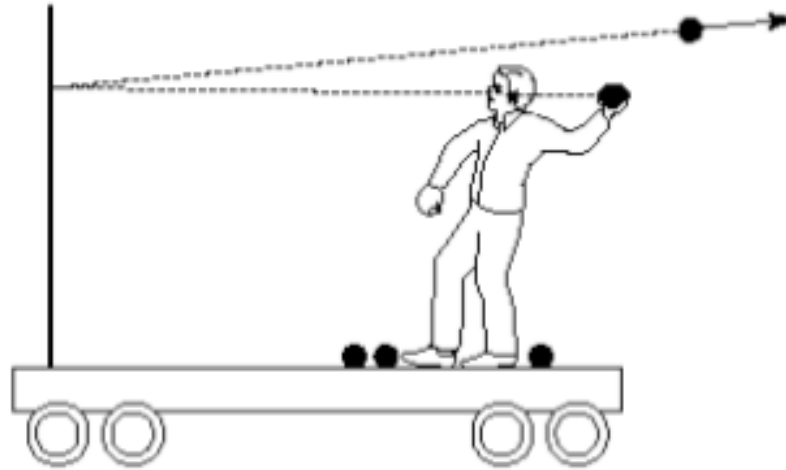

Eric Mazur, "Peer Instruction"

A. Yes, left
B. Yes, right
C. No
D. Don't know

A wood block rests at rest on a table. A bullet shot into the block stops inside, and the bullet plus block start sliding on the frictionless surface. The momentum of the bullet remains constant
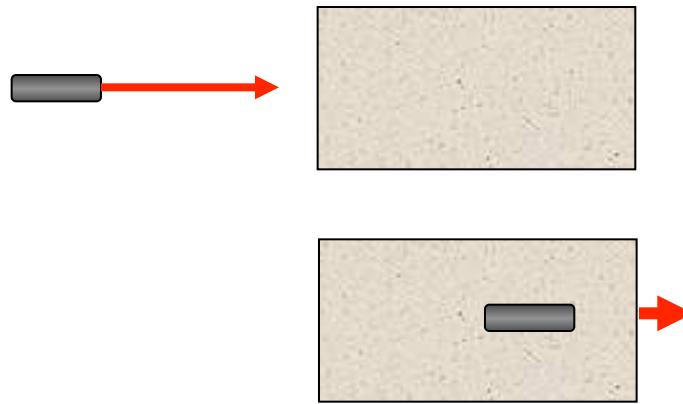

1. When the bullet approaches.
2. When the bullet is slowing down.
3. After the bullet stops.
4. 1 and 3.
5. 2 and 3.
6. 1 and 2.
7. It never is conserved.
8. It always is conserved.

A wood block rests at rest on a table. A bullet shot into the block stops inside, and the bullet plus block start sliding on the frictionless surface. The momentum of the bullet plus block remains constant
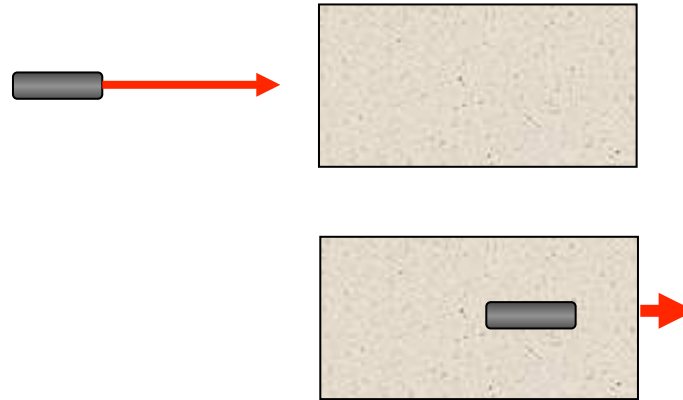
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A car with a mass M is moving toward another car with a mass 2 M on a frictionless surface. Both cars have a speed of 10 m/s. Subsequently, they collide and stick together. What is the final velocity of the two car system?

BEFORE

AFTER

V = ?

+x
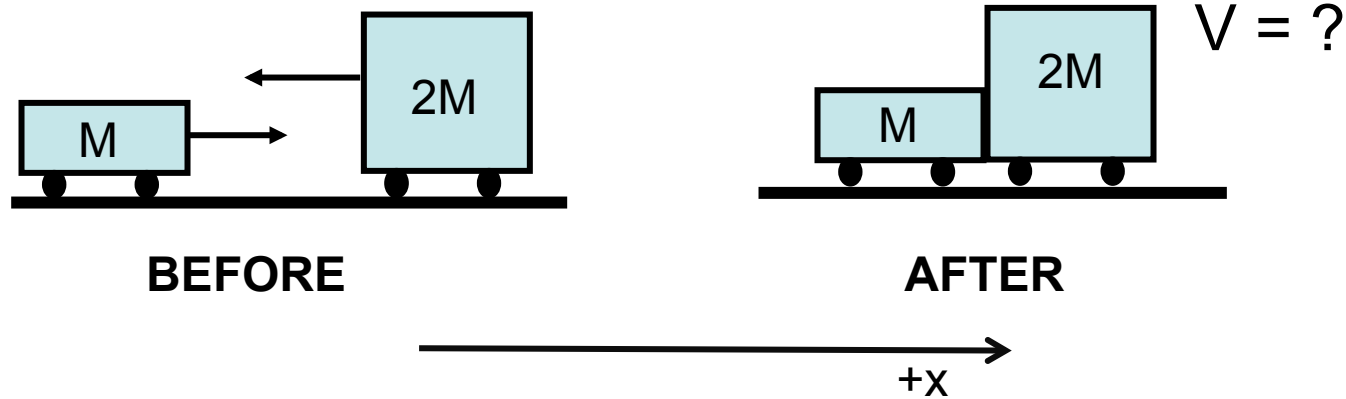
1.   0 m/s
2.   +3.3 m/s
3.   -3.3 m/s
4.   +5.0 m/s
5.   -5.0 m/s
6.   +10 m/s
7.   -10 m/s
8.   None of the above

Two cars initially at rest on a frictionless surface are blown apart by an explosion. The one with twice the mass ends up moving to the right at 10 meters/second. The less massive car ends up moving to the left at what speed?
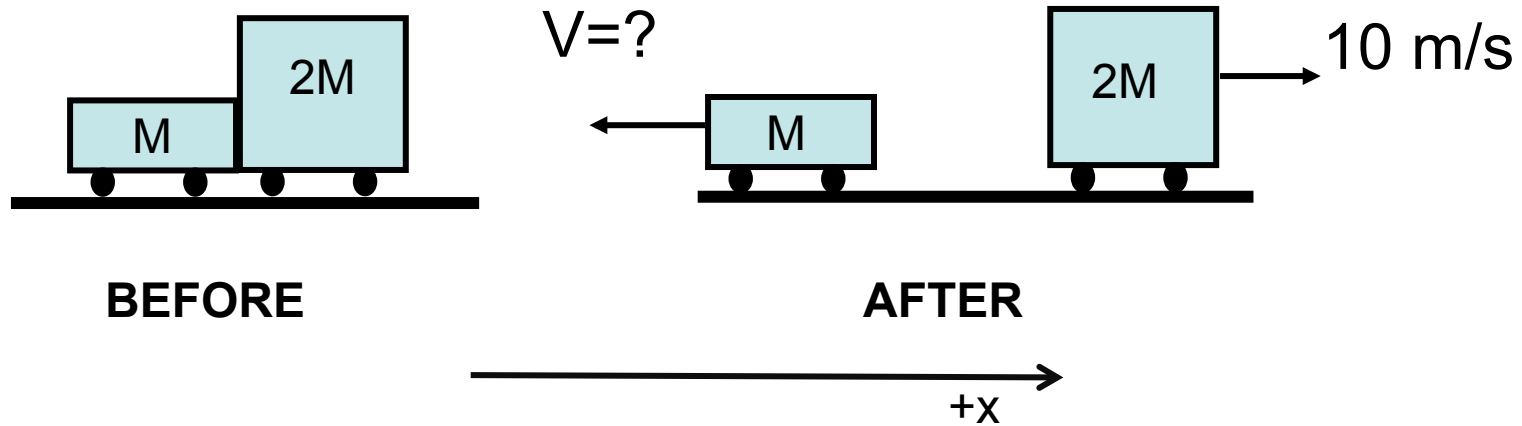
1. 5 m/s
2. 7 m/s
3. 10 m/s
4. 14 m/s
5. 15 m/s
6. 20 m/s
7. 25 m/s

One cue ball hits an object ball. The cue ball's motion is at a 90° angle to the motion of the object ball after the collision. The ratio of speed of the cue ball after the collision and the object ball is $1:\sqrt{3}$. What is the ratio of the velocity between the initial and final speed of the cue ball? All balls have the same mass.

Initial : Final

1. $1:\sqrt{3}$

2.   2:1

3. $\sqrt{3}:1$

4.   1:1

5.   1:2

6. $1+\sqrt{3}:\sqrt{3}$

$90°$