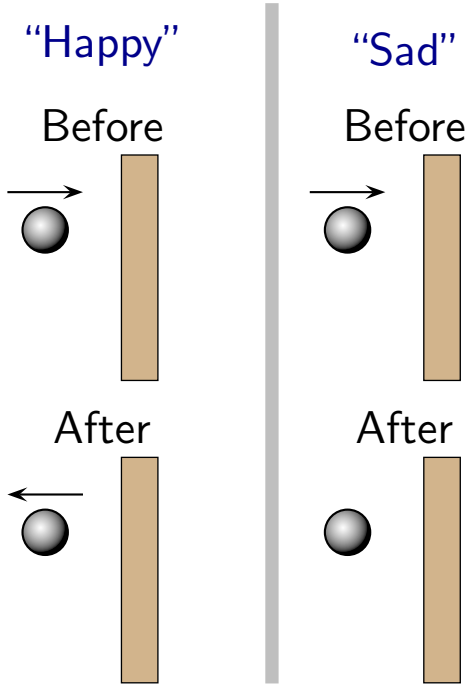
Warm Up Question 1

A $0.50\,\mathrm{kg}$ ball bounces off a vertical wall. Immediately before hitting the wall, the ball travels horizontally to the right with speed $10\,\mathrm{m/s}$. Immediately after, the ball bounces off horizontally to the left with the same speed. Does the momentum of the ball change or not? Explain your answer.

1. Changes. Direction of velocity changes.
2. Does not change. Mass and speed are the same.

Question 1

Two balls are each thrown with the same speed at identical wooden blocks, initially at rest. The masses of the balls are identical but one ("happy") rebounds from the block and the other ("sad") stops.



Prior to collision the speeds of the balls are identical. In which case is the speed of the block greatest after the collision?

1. Speeds are the same.
2. "Happy" ball collision.
3. "Sad" ball collision.

Warm Up Question 2

Two identical objects approach each other in opposite directions with the same speed. They collide and stick together. Explain whether or not the energy defined as $E = K + U_{\text{grav}}$ is conserved in this process.

1. Conserved. KE is transformed gravitational PE.
2. Conserved. The total KE before was zero and after it is zero.
3. Not conserved. The balls are at rest after the collision.
4. Not conserved. There are two forces that do non-zero work.