

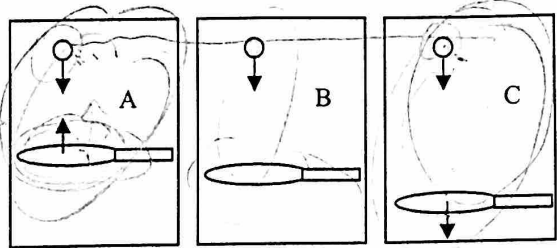
Notes: Heating with Compression – Cooling with Expansion

In the three pictures on the right, a “perfectly bouncy” ping pong ball is dropped onto a “perfectly bouncy” ping pong paddle.

1. In which situation will the ball speed up the most (and bounce highest) after being hit by the paddle? *A*

2. In which situation will the ball slow down the most (and bounce the least) after being hit by the paddle? *C*

3. In which situation will the ball’s speed remain approximately the same after hitting the paddle? *B*

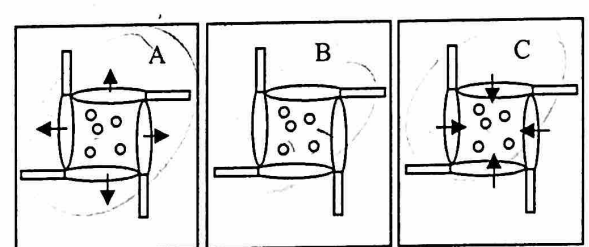


The three pictures on the right show “boxes” which have tennis rackets for walls. Inside the boxes, tennis balls are bouncing around. In one box, the walls are pushing inward against the balls. In another box, the rackets are relaxed, allowing the balls to push them out. In a third box the walls are held stationary.

4. In which “box” will the walls’ behavior cause the balls to speed up? *C*

5. In which “box” will the walls behavior cause the balls to slow down? *A*

6. In which “box” will the walls behavior not affect the balls’ speeds? *B*



7. Why does rapidly compressing a gas cause the temperature to increase?

*When I compress (squeeze) a gas, I push the molecules, speeding them up and giving them my energy.*

8. Why does allowing a gas to rapidly decompress cause its temperature to decrease?

*When I release, the gas molecules push my hands outward. They give their energy to me, so they have less energy and move slower.*

