

# Behavior of Gases

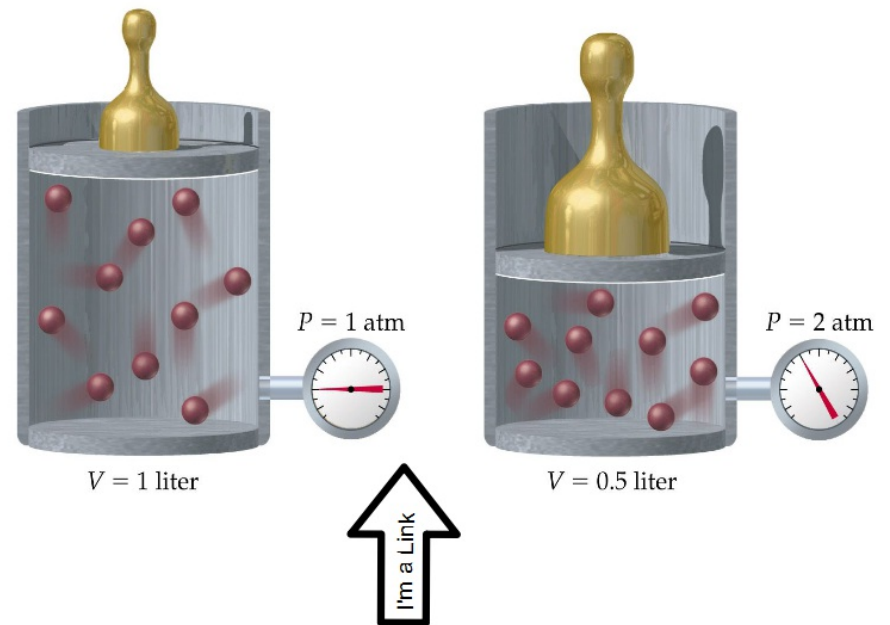


# Boyle's Law - Volume and Pressure

- Robert Boyle (1627-1691) a British scientist
- Found that the volume of a flexible container of gas (balloon) will increase when the the pressure surrounding the conatiner (balloon) decreases (this works in the opposite direction too!)
- Boyle's Law: if you decrease the volume of a conatiner of gas and hold the temperature constant, the pressure from the gas will increase.

initial presure  $\times$  initial volume =  
final pressure  $\times$  final volume

$$P_i V_i = P_f V_f$$



# Charles's Law - Temperature and Volume

- Jacques Charles (1746-1823) a French scientist
- Charles's Law: the volume of a gas increases with increasing temperature, as long as the pressure on the gas does not change (the opposite is true too!)
- As a gas is heated up the particles move faster and faster striking the wall of the container more frequently as well as with more force

$$\frac{\text{initial volume}}{\text{initial temperature}} = \frac{\text{final volume}}{\text{final temperature}}$$

$$\frac{V_i}{T_i} = \frac{V_f}{T_f}$$

