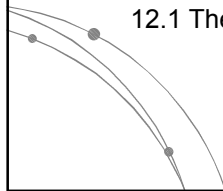


Chapter 12 Behavior of Gases

12.1 The Properties of Gases



Kinetic Theory Revisited

1. Small hard particles that have Mass

Large empty space

2. No Attractive Forces

3. Rapid Motion

Straight path

Elastic collisions



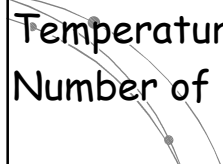
How is a gas measured?

Pressure: P kPa, atm

Volume: V Liters

Temperature: T kelvins

Number of moles: n



Standard Temperature and Pressure

STP

Temperature: 0°C

Pressure: 1 atm
760 mm Hg
101.3 kPa

The Properties of Gases

1) Using the kinetic-molecular theory, explain why a tire blowout is more likely to happen on a trip in the summer than on one taken in winter?

Ave temp in summer is greater
At higher temps, have greater KE & results in greater pressure.

The Properties of Gases

2) Use the kinetic theory to explain why on a cold autumn morning a camper's air mattress may appear to be somewhat flatter than it was when blown up the afternoon before. Assume no leaks.

Pressure will decrease

Facts about **Kelvin**

- Values are like Centigrade (Celsius) scale only no degree sign.
- Zero point is different. ($273\text{ K} = 0^{\circ}\text{C}$)
- No negative values, useful for calculations.
- A doubling of the Kelvin value for the temperature equals a doubling of the K.E.

**Factors Affecting
Gas Pressure**

Volume

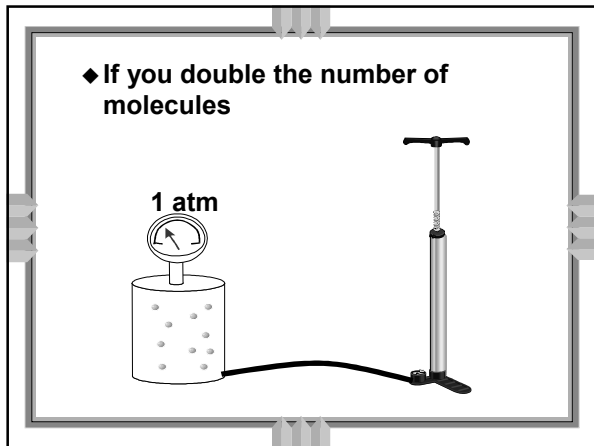
Temperature

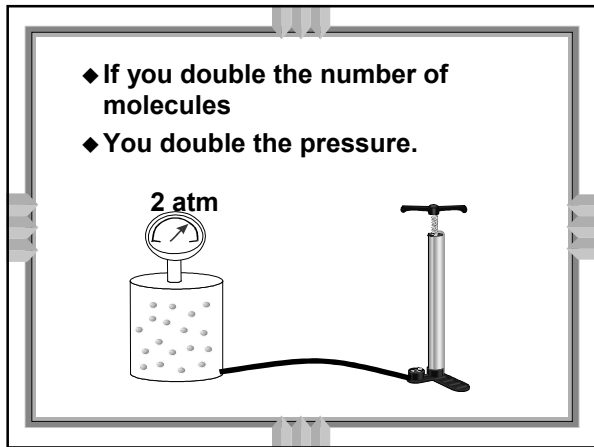
Number of particles

Pressure is defined as the force per unit of surface area.

- How does increasing the number of gas particles affect the pressure?

The more particles colliding with the walls of a container, the higher the rate of pressure.





What happens if we change any of the factors?

To determine any change we need to look at only two factors at a time.

The other two factors must be kept constant.

P T V

Write the Letters on a card .

Grab the letter of the factor that will remain constant.

Number of particles will be constant too. Move the card to see what the other factors do.

What will happen if...

Pressure is constant and temperature goes up?

Temperature is constant and volume goes down?

Volume is constant and pressure goes up?

Gas Pressure

Describe what effect tripling the number of gas particles in a closed container would have on the pressure exerted by the gas.

The pressure would triple

Gas Pressure

Describe what effect doubling the volume of an enclosed gas would have on the pressure.

Pressure would decrease by half

Gas Pressure

Describe how the pressure of an enclosed gas changes with increase in temperature.

Pressure would increase

Amount of Gas

- The difference in pressure between the inside of the aerosol spray can and the air outside allows aerosol spray cans to work. What is the pressure inside the can when the aerosol will no longer spray?
- $P_{\text{inside}} = P_{\text{outside}}$
