


MATTER
Solids, Liquids, & Gases

III. Behavior of Gases

- ◆ Pressure
- ◆ Boyle's Law
- ◆ Charles' Law

A. Pressure

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$


Which shoes create the most pressure?

A. Pressure

◆ **Key Units at Sea Level**

101.325 kPa (kilopascal)

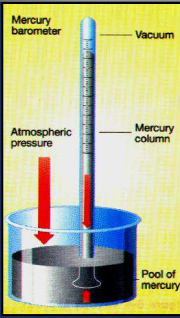
1 atm

760 mm Hg

14.7 psi

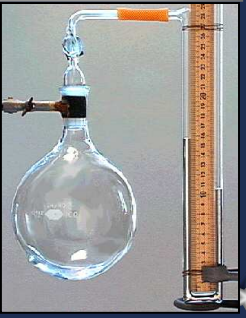
$$kPa = \frac{N}{m^2}$$

A. Pressure



Atmospheric Pressure

Barometer



Contained Pressure

Manometer

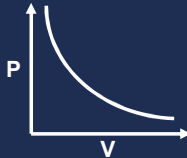
A. Pressure

◆ **Effect on Boiling Point**

- ◆ When atmospheric pressure increases, the boiling point of a liquid increases.
- ◆ EX: high altitude cooking, boiling cold water

B. Boyle's Law

◆ When the volume of a gas decreases, its pressure increases (at constant temp).

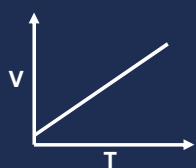


$$PV = k$$

INVERSE

C. Charles' Law

- When the temperature of a gas increases, its volume also increases (at constant pressure).



DIRECT

$$\frac{V}{T} = k$$

C. Charles' Law

- Absolute Zero** - Temp at which...
 - the volume of a gas would equal zero.
 - all particle motion would stop.

-273°C
or
0 K

