Gas Laws Lessons

1. Atmosphere – environmental chemistry

1. Greenhouse effect – CO2 build up
2. Ozone depletion – CFC’s

2. Barometer

1. H2O vs. mercury
2. Unit conversions (1 atm = 760 mm Hg = 101.3 kPa)
3. Air pressure 🡪 14.7 psi (break wooden stick with newspaper)

Weather [High] 🡪 [Low] suck balloon in jar

 d. graduated cylinder with 4-holes (water pressure)

3. Manometer (U-tube)

1. confined gas
2. vapor pressure (evaporation vs. boiling)

4. Kinetic Molecular Theory

1. Metronome (P, T, V, n)
2. Heat = average kinetic energy

5. Bernoulli’s Principle

 fast moving air “air” (fluid) 🡪 low pressure

 e.g. airplane wing; vacuum cleaner (tornado)

6. Boyle’s Law P1V1 = P2V2  (temperature = constant)

 a. overhead measurement (cylinder & pressure gauge)

b. Bell jar – balloons; shaving cream

c. Liquefaction of gases 🡪 compressed gas; high pressure (proper storage of gases)

d. Bed of nails 

7. Charles’ Law  (pressure = constant)

 a. overhead measurement (absolute zero ball & pressure gauge)

8. Amonton’s Law  (volume = constant)

1. Feb. 15 (discount balloons)
2. Tire pressure (race cars)
3. Pressure cooker
4. Ammonia fountain (cold boil)

9. Combined Gas Law 

10. Density of Gases 

 density is an intensive property 

11. Self-Cooling Can

12. Graham’s Law of Diffusion

 

1. HCl & NH3 in glass tube
2. Effusion [high] 🡪 [low] through pores (effusion)

13. Dalton’s Law of Partial Pressures (Lab: Mg + HCl)

14. Ideal Gas Law PV = nRT

  

15. SCUBA diving