

## Unit 7 – Gases

1. Gas mixtures are homogeneous b/c of the constant random motion of the particles.
2. Gases are compressible b/c of the large spaces between the particles.
3. Gas pressure is caused by collisions of particles with the walls of the container.  
More Collisions = More Pressure
4. P and V are inversely related...doubling the volume of a container will cut the pressure of the gas in half.
5. T and V are directly related...If you heat a balloon, it will expand.
6. T and P are directly related...If you heat a rigid container, the pressure of the gas will increase.
7.  $PV=nRT$  Units: Temperature = Kelvin; Volume = Liters; Pressure = atm  
Use this gas constant →  $R=0.08206$
8. One mole of an ideal gas = 22.4 Liters ONLY at STP!!
9. Gas pressure and # of moles are directly related...if you double the mole of gas in a container, the pressure will double.
10. Molar Mass =  $dRT/P$  The “d” stands for density in units of g/L  
Use this gas constant →  $R=0.08206$
11. The more molar mass a gas has, the slower it moves at a given temperature.
12. Temperature = Average Kinetic Energy  
(Gases at the same temperature have the same average kinetic energy.)
13. When collecting a gas by water displacement:  $P_{\text{total}} = P_{\text{dry gas}} + P_{\text{water vapor}}$
14. Real gases behave most like an ideal gas at high temperature and at low pressure. The more polar a gas is and the larger a gas is, the more it will **deviate** from ideal behavior. Consequently, small, nonpolar gases are the most ideal.

# Thou Shalt Not Forget Questions

Credit: Dan Reid

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## Unit 7 – Gases

1. Why are all gas mixtures homogeneous?
2. Why are gases compressible?
3. What causes gas pressure?
4. P and V are inversely or directly related?
5. T and V are inversely or directly related?
6. T and P are inversely or directly related?
7. In the formula  $PV=nRT$ , what are the units for P, V, n, and T
8. One mole of an ideal gas = \_\_\_\_\_ Liters at STP.
9. Gas pressure and # of moles are inversely or directly related?
10. a)  $dRT/P$  equals what quantity?  
b) The “d” in  $dRT/P$  has what metric units?
11. The more molar mass a gas has, the faster or slower it moves?
12. Average Kinetic Energy is another term for \_\_\_\_\_.
13. What 2 pressures add together when calculating the total pressure of a gas collected by water displacement?
14. a) Real gases behave most like an ideal gas at what conditions of temperature and pressure?  
b) What gases deviate from ideal behavior the most? The least?  
small polar, large polar, small nonpolar, large nonpolar?