

Chapter 9
Properties of Gases: The Air We Breathe
Learning Objectives

8.2.2021

To satisfy the minimum requirements for this course, you should be able to:

1. Discuss the Kinetic Molecular Theory of gases and:
 - describe the assumptions made in the Kinetic Molecular Theory and use the theory to explain the nature of gas pressure and temperature
 - describe how the distribution of speeds and the average speed of gas molecules change with temperature
 - at a given temperature, arrange gases in order of increasing average molecular speed
2. List the physical characteristics shared by all gases and:
 - identify elements that exist as diatomic gases or monatomic gases at 25°C and 1 atm
 - be able to convert between the units of atmosphere (atm) and torr (or mm Hg)
 - understand how to measure the pressure of a gas
 - define mole fraction of a gas
3. Use the ideal gas equation ($PV = nRT$) to:
 - calculate P, V, n, or T given the other three variables and describe how a gas responds to changes in P, V, n, or T
 - calculate the molar mass of a gas and the density of a gas
 - solve stoichiometry problems involving gases
4. State Dalton's Law of Partial Pressure and be able to:
 - calculate the partial pressure of any gas in a mixture, given the composition of that mixture
 - calculate the mole fraction of a gas in a mixture, given its partial pressure and the total pressure of the system

N.B. We will not be doing Section 9.10