Chapter Outline
Honors Chemistry Running Start
Dr. Campbell

"We must trust to nothing but facts: These are presented to us by Nature, and cannot deceive. We ought, in every instance, to submit our reasoning to the test of experiment, and never to search for truth but by the natural road of experiment and observation."
– **Antoine Lavoisier, Elements of Chemistry**

Chapter 5 Gases

MAIN OBJECTIVE: to use kinetic molecular theory and the gas laws to describe the behavior of an ideal gas

Learning Outcomes by section:

5.6 The Kinetic Molecular Theory of Gases
- Understand the major points of kinetic molecular theory
- Use kinetic molecular theory to explain the behavior of an ideal gas

Suggested Practice Problems: 29, 105, 107, 109a

5.1 Pressure
- Understand how pressure is measured
- Be able to convert between the different pressure units

Suggested Practice Problems: 21, 37, 39, 41

5.2 The Gas Laws of Boyle, Charles, and Avogadro
- Understand the relationship between temperature and pressure for an ideal gas
- Understand the relationship between temperature and volume for an ideal gas
- Understand the relationship between volume and pressure for an ideal gas
- Understand the relationship between number of moles and volume for an ideal gas
- Use kinetic molecular theory to explain these relationships between variables on a molecular level

Suggested Practice Problems: 23, 57

5.3 The Ideal Gas Law
- Use the ideal gas law to perform calculations about an ideal gas
- Be able to work with the different values of the universal gas constant
- Understand the relationship between the ideal gas law and the combined gas law
- Use the combined gas law to perform calculations about an ideal gas under two sets of conditions

Suggested Practice Problems: 25, 43, 45, 47, 49, 51, 53, 55, 59, 61, 63

5.4 Gas Stoichiometry
- Know how to use the molar volume of a gas to perform stoichiometry calculations at STP
- Use the ideal gas law to perform stoichiometry calculations when not at STP

Suggested Practice Problems: 31, 65, 67, 69, 71, 73, 75

5.5 Dalton's Law of Partial Pressures
- Be able to explain Dalton's Law of Partial Pressures using kinetic molecular theory
- Use Dalton's Law of Partial Pressures in gas laws calculations

Suggested Practice Problems: 81, 83, 85, 87, 99(uses stoich, too)

5.7 Effusion & Diffusion
- Be able to explain the movement of gases using kinetic molecular theory
- Understand the difference between effusion and diffusion
- Use the molar mass of gases to determine the relative speeds of the gases

Suggested Practice Problems: 109b, 113

Problem Set:

**All problem set work should be done in a dedicated chemistry homework notebook. The problem set is due at the beginning of class on the day of the test. In order to receive full credit, all problems should be legible and have written work showing how the answer was arrived at.
Questions (beginning on page 234): 38, 44, 48, 58, 70, 84, 106, 110