# The Nature of Gases-Part 1

***Study Guide for Chapter 13***

**Lesson Objectives:**

- ❑ Describe the assumptions of the kinetic theory as it applies to gases.
- ❑ Interpret gas pressure in terms of kinetic theory.
- ❑ Define the relationship between Kelvin temperature and average kinetic energy.

**Vocabulary: Drag and Drop**

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|---|---|---|
| **Kinetic energy** | **vacuum** | **pascal (Pa)** |
| **Kinetic theory** | **atmospheric pressure** | **barometer** |
| **Gas pressure** | **standard atmospheric pressure(atm)** | |

_____ 1. the work needed to accelerate a body of a given mass from rest to its stated velocity.

_____ 2. the force exerted on a surface by the air above it as gravity pulls it to Earth.

_____ 3. space in which there is no matter or in which the pressure is so low that particles in the space do not affect any processes being carried on there.

_____ 4. device used to measure atmospheric pressure.

_____ 5. the force exerted on a given area

_____ 6. model that describes a gas as a large number of identical particles, all of which are in constant, rapid, random motion

_____ 7. SI unit of pressure that is equal to the force of one newton exerted on one square meter

_____ 8. equals 760 mm of mercury, or 101.3 kPa

Complete the following:

The kinetic theory describes the (9) _____ of particles in matter and the forces of attraction between them. The theory assumes that the volume occupied by a gas is mostly (10) _____ , that the particles of gas are relatively (11) _____, move (12) _____ of each other, and are in constant (13) _____ motion. The (14) _____ between particles are perfectly elastic so that the total (15) _____ remains constant. Gas pressure results from the simultaneous collisions of particles with an object. Barometers are used to measure(16) _____ pressure. Standard conditions are defined as temperature of (17) _____ and a pressure of (18) _____.

**True-False**: *Classify each of these statements as always true (AT), sometimes true (ST), or never true (NT) using the drop down menu.* Think before you choose.

_____ 19. Atmospheric pressure is 760 mm Hg.

_____ 20. The SI unit of pressure is the pascal.

_____ 21. Atmospheric pressure increases as you climb a mountain because the density of Earth's atmosphere decreases with altitude.

_____ 22. When particles of a substance are heated, some of the energy is absorbed by the particles and stored in the form of potential energy.

_____ 23. The Kelvin temperature of a substance is directly related to the total kinetic energy of the particles in the substance.

_____ 24. At any given temperature, the particles of all substances have the same average kinetic energy.