Vocabulary: Temperature and Particle Motion

Vocabulary

- Absolute zero – the coldest possible temperature.
  - Absolute zero is equivalent to 0 K, -273.15 °C, or -459.67 °F.
  - At absolute zero, the molecules in a substance do not move.
- Kelvin scale – a temperature scale that is measured from *absolute zero*, the coldest possible temperature.
  - On the Kelvin scale, water freezes at 273.15 K and boils at 373.15 K.
- Kinetic energy – energy of motion.
  - The faster an object is moving, the greater its kinetic energy.
  - The more massive a moving object is, the greater its kinetic energy.
- Maxwell-Boltzmann distribution – a probability distribution that shows the fraction of particles moving at a given velocity at a given temperature.
- Molar mass – the mass of one mole of a substance.
  - A mole of a substance has a mass in grams that is equal to the atomic mass of the substance.
  - For example, the atomic mass of carbon is 12.011 atomic mass units. The molar mass of carbon is 12.011 grams, or 0.012011 kilograms.
  - There are exactly 6.0221415×10^{23} particles of a substance in a mole of that substance. This number is called *Avogadro's number*.
- Molecule – a stable particle made of two or more atoms.
  - A water molecule (H_2O) is made of two hydrogen atoms and one oxygen atom.
- Temperature – the hotness or coldness of a substance.
  - Temperature is a measure of the average kinetic energy of a group of particles.
  - As the temperature of a fluid increases, so does the average speed of the particles that make up the fluid.
- Universal gas constant – the constant in the gas equation, equal to 8.314 J/K mol.
  - In equations, the symbol for the universal gas constant is *R*.