**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 × 1023 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 (H2O) 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*.