**Vocabulary:** **Chemical Equations**

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**Vocabulary**

* Avogadro’s number – the number of atoms or molecules in a *mole* of a substance.
  + Avogadro’s number is equal to 6.0221415 × 1023.
* Chemical equation – a symbolic representation of a chemical reaction.
  + In a chemical equation, reactants are shown on the left, and products are shown on the right.
  + For example, the chemical equation Na + Cl2 🡪 NaCl describes the reaction of sodium (Na) and chlorine gas (Cl2) to form table salt.
  + In a balancedchemical equation, there are the same numbers of each type of atom on each side of the equation: 2Na + Cl2 🡪 2NaCl is balanced because there are two sodium atoms and two chlorine atoms on each side of the equation.
* Chemical formula – a symbolic representation of an element or compound.
  + Chemical formulas use *subscripts* and parentheses to denote the number of atoms in a molecule of the substance.
  + Examples of chemical formulas include NaCl (table salt), H2O (water), and Ca(OH)2 (calcium hydroxide).
* Chemical reaction – a process in which one or more substances are transformed into others.
  + In a chemical reaction, bonds between atoms are broken and new bonds are formed, joining atoms into different combinations.
  + No atoms are created or destroyed in a chemical reaction.
* Coefficient – a number that multiplies a term in an equation.
  + In a chemical equation, the coefficients indicate the number of each type of molecule. For example, 6H2O means that there are six water molecules.
* Combination – a chemical reaction in which two or more reactants form a single product.
  + Combination reactions are also called *synthesis* reactions.
  + For example, hydrogen (H2) combines with oxygen (O2) to form water (H2O).
* Combustion – a chemical reaction in which a fuel is burned.
  + Most examples of combustion involve the burning of a hydrocarbon in oxygen, producing water and carbon dioxide.
  + For example, methane burns in oxygen to form water and carbon dioxide:

CH4 + 2O2 🡪 2H2O + CO2

* Conservation of matter – a scientific law that states that the total amount of matter in a closed system remains constant.
  + A chemical equation satisfies conservation of matter if it is balanced.
* Decomposition – a chemical reaction in which a single substance is broken down into two or more products.
  + For example, salt (NaCl) can be decomposed into sodium (Na) and chlorine gas (Cl2).

* Double replacement – a chemical reaction in which two compounds exchange elements or molecules with one another.
  + For example, sodium sulfide (Na2S) and hydrochloric acid (HCl) react to form salt (NaCl) and hydrogen sulfide (H2S).
* Molar mass – the mass of one mole of a substance.
  + The molar mass of an element or compound in grams is equal to the atomic mass of the atom or molecule of which it is composed.
  + For example, the atomic mass of an oxygen molecule (O2) is 32 universal mass units. The molar mass of oxygen gas is 32 grams.
* Mole – a unit amount of substance.
  + A mole of a substance has the same number of particles as 12.0 grams of carbon-12.
  + The SI symbol for the mole is “mol.”
* Molecular mass – (M) the mass of a molecule of a substance, as measured in universal mass units (u).
* Molecule – a stable particle made of two or more atoms.
  + A water molecule (H2O) is made of two hydrogen atoms and one oxygen atom.
* Product – a substance that is formed in a chemical reaction.
* Reactant – a substance that takes part in a chemical reaction.
* Single replacement – a chemical reaction in which an element reacts with a compound to form a new compound and a different element.
  + For example, aluminum (Al) reacts with hydrochloric acid (HCl) to form aluminum chloride (AlCl3) and hydrogen gas (H2).
* Subscript – a number in a chemical formula representing the number of atoms of a particular element in one molecule of the compound.
  + For example, the subscript “2” in H2O indicates that there are two hydrogen atoms in a water molecule.