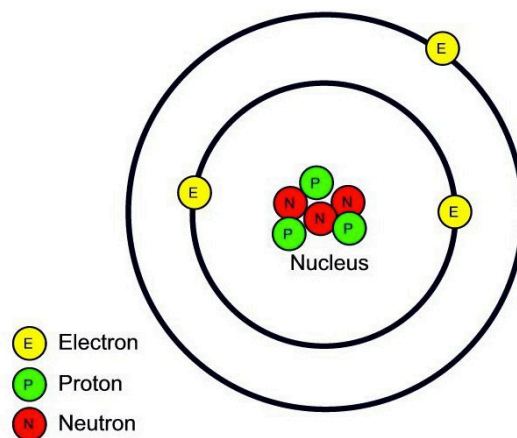
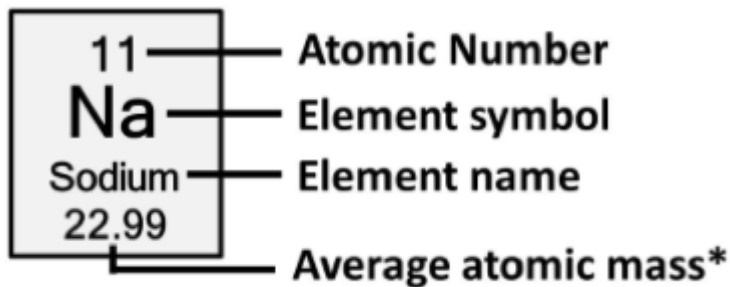


Chemistry Review

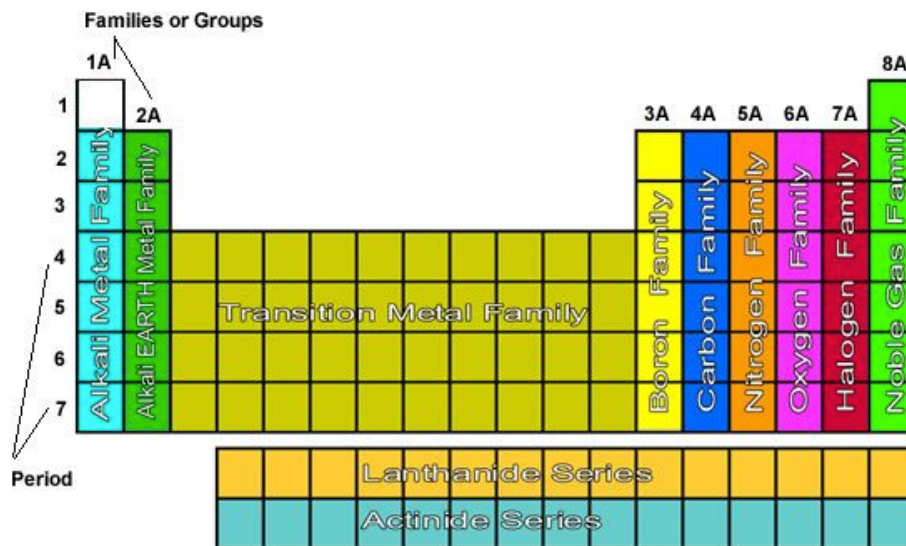
- **The Law of Conservation of Matter** states that matter cannot be created nor destroyed, it only changes form.
- **Physical Properties of Matter**— color, shape, texture, melting point, conductivity, hardness, density, the state of the matter, dissolving into fluids, etc. These are generally reversible changes or do not change the chemical structure of the matter.
- **Chemical Properties of Matter**—characteristics that can be observed when chemicals change (any *irreversible* change by ordinary means) into other substance such as when burning, rusting, tarnishing, bubbling, temperature changes without the help of outside sources, color changes such as *turning black when burned*, and other unexpected color changes, etc.
- **Atom structure**—protons (+) and neutrons (0) are found in the nucleus and electrons (-) orbit the nucleus in the energy levels (rings, shells, clouds all refer to the energy levels).
 - Most of the mass of the atom is found in the nucleus.
 - Atoms are the smallest unit of matter that retains individual properties.
 - Atoms make up elements.



- **The Periodic Table of Elements** organizes elements based on their atomic structure and similarly reactive behavior as other elements in their groups.
 - Elements are all one kind of atom; a pure substance; found on the Periodic Table of Elements; can combine to create molecules.
 - Each element found on the Periodic table has an **element symbol**, an **atomic number** (which states the number of protons), and the **atomic mass** of the element's atom.



- **Periods** are the horizontal rows on the Periodic Table and is the number of energy levels of atoms inside their respective period.
- **Groups** are the vertical columns and are organized to give an idea of the number of valence electrons in the respective element's atoms in each group.



- **Molecules** are 2 or more atoms (can be the same or different elements) that are chemically joined.
- **Compounds** are a type of molecule with 2 or more ***different*** element's atoms chemically joined to form a completely different substance from the original element atoms.
- A **chemical formula** is a ratio of a compound. Ex. H₂O
- A **coefficient** is the large number found in front of the formula and states the number of molecules in that formula. For example, in 3CO₂, the coefficient is 3 and there are 3 molecules of CO₂.
- A **subscript** is the small number behind the element symbol in a formula and states the number of atoms of that element in a given formula (like a ratio). For example, in 3CO₂, the subscript is 2 and there are 2 atoms of Oxygen in each CO₂ molecule.
- In a **chemical equation**, molecules before the “yields” arrow (→) are called reactant and those after the “yields” arrow are called the product. For example, in the equation 2H₂ + O₂ → 2H₂O, the 2H₂ and O₂ are reactants and the 2H₂O is the product.

APE MAN Strategy

In a Neutral Atom:

- The atomic number will equal the number of protons and electrons
- The mass number (rounded to the nearest whole number) **MINUS** the atomic number will equal the number of neutrons

$$A_{\text{Atomic Number}} = P_{\text{Protons}} = E_{\text{Electrons}}$$

$$M_{\text{Mass Number}} - A_{\text{Atomic Number}} = N_{\text{Neutrons}}$$