The Periodic Table

Periodic Table of Elements - all elements organized into a chart based on their properties

* created by Dmitri Mendeleev
- rows and columns of boxes
- each box has:
  - element name
  - chemical symbol
  - atomic number
  - atomic mass

Chemical symbol - one or two letters used to represent the element

- first is always capitalized, second (if there is one) is lowercase

Atomic Mass - the average mass of an atom of that element

* unit - amu

Atomic Number - the number of protons in an atom of that element

Period - each row of elements

- left to right
- by atomic number

Group or family - each column of elements

- share similar physical & chemical properties

Atoms - the smallest particle into which an element can be divided and still maintain properties of that element.
- building blocks of matter

Atoms are made up of
- protons - positively charged particles located in the nucleus
- neutrons - electrically neutral particles located in the nucleus
- Electrons - negatively charged particles found outside the nucleus
  - ↳ also known as electron cloud

Isotopes - atoms of the same element that have different number of neutrons

Fun Facts!
- Atomic Size - one ten-billionth of a meter in diameter
- Nucleus Size - one million billionth of a meter in diameter

Elements - different kinds of atoms

Compounds - 2 or more elements that have combined

Elements - the simplest form of matter

Pure Substance - made of only one kind of element

Molecule - 2 or more atoms combined
- smallest particle of a substance
- simplest only have 2 atoms
  ex. O_2
- most have 2 or more atoms
  ex. H_2O

Compounds - most elements found in combination with other elements
- fixed ratio
  ↳ ex. H_2O
- properties different than the properties of the elements that make it up.

Chemical Bond - the force of attraction between atoms
- transfer or share electrons

Ionic Bond - one or more electrons from one atom are transferred to another
- (positive ion) loses electrons - atom positively charged
- (negative ion) gains electrons - atom negatively charged
- * unlike charges (opposite) attract & form bond

Example: NaCl
Na gives electron to Cl
$Na^+ \rightarrow \leftarrow Cl^-$

Covalent Bond - atoms share one or more electrons
- shared electrons spend time between the two atoms
- negative electrons attract to positive nucleus

Example: H_2O
H shares electron with O
O shares electron with H

* all atoms want outside electron shell to be full.
Full = stable

# of electrons in outside shell = group #