Matter

Elemental Notation

Review of Terms

Matter:

- Anything that has mass and occupies volume (space)

Physical Properties:

- A property you can observe without the material changing into another substance.
- Example: colour, state, density, hardness, solubility

Chemical Properties:

- A property you can observe when one kind of matter is changing into a new substance.
- Example: combustibility, reaction with an acid, reaction with water

Review of Terms

Qualitative Observation:

- An observation that can be described but cannot be expressed with number.
- Example: odour, colour, sound

Quantitative Observation:

- An observation that can be measured and expressed with numbers.
- Example: temperature, volume, mass

The Atom

- The atom is the smallest amount of any element which can exist, while still maintaining its characteristic properties
- The atom is the building block of matter
- It is made up of three subatomic particles:
  - Electrons
  - Protons
  - Neutrons

The Atom

- All atoms of the same element have the same number of protons
- Since an atom is neutral and protons are positive, we can conclude that:
  - # of protons = # of electrons

Subatomic Particle	Relative Mass	Relative Charge	Symbol	Location in Atom
Proton	1	+1	p^+	Nucleus
Neutron	1	0	n^o	Nucleus
Electron	0.0005	-1	e^-	Orbiting Nucleus

Atomic Number (Z)

- Each element is determined by the number of ***protons*** it contains in the nucleus
- The number of protons is also known as the ATOMIC NUMBER
- Calcium has an atomic number of 20, therefore there are 20 protons in Ca

Atomic Mass (A)

- Atomic mass is determined by adding the number of protons and neutrons together
- Atomic mass = # of protons + # of neutrons

Scientific (Chemical) Notation

$$ {}^{A}_{Z}X $$

X = atomic symbol
Z = atomic number
A = mass number

$$ {}^{19}_{9}F $$

Practice

Elemental Notation and Subatomic Particles Worksheet

Read section 1.2 (pg 22)

Understand that you are responsible for all material listed in your notes

(i.e., pgs 17-31)