1. Tiny invisible particles
2. Atoms of one element are the same
3. Atoms of different elements are different
4. Compounds by compounding atoms

JJ Thompson: Father of electrons
Atoms are positive (the dough)
Electrons are negative (raisins) around atoms

Ernest Rutherford: Gold foil = discovered the nucleus/ protons
Atoms are mostly empty space
The center of atoms are dense, it is called the nucleus

Neil Bohr: Improved Rutherford's model
Electrons moved/ orbits the nucleus in layers
Electrons jump to outer ring in excited state

Isotopes: 2 or more of the same element. Same number of protons, different numbers of neutrons because atomic mass is different.

Ex. Co-60 = 60 is mass

<u>Average atomic mass (AAM)</u>
(*mass of isotope* 1 *x relative abundance of isotope* 1)
+ (*mass of isotope* 2 *x relative abundance of isotope* 2)
Ex. Chlorine has two isotopes Cl-35 and Cl-37, if the average mass is 35.4 amu, what are the % abundances?

(35)(x) + (37)(1-x) = 35.4
35x + 37 – 37x = 35.4
-2x + 37 = 35.4
37 – 35.4 = 2x
$\frac{1.6}{2} = x$
0.8 = x
20% is the abundance

<u>Mass Spectrometer</u> used to find the different isotopes in an element
1. Vaporized (turn into gas)
2. Ionize (remove negative charges)
3. Accelerate (particles move in single file line)
4. Deflect (particles pass thru magnetic field more mass = less deflection)
5. Detect (electron multiplier; amplify results)