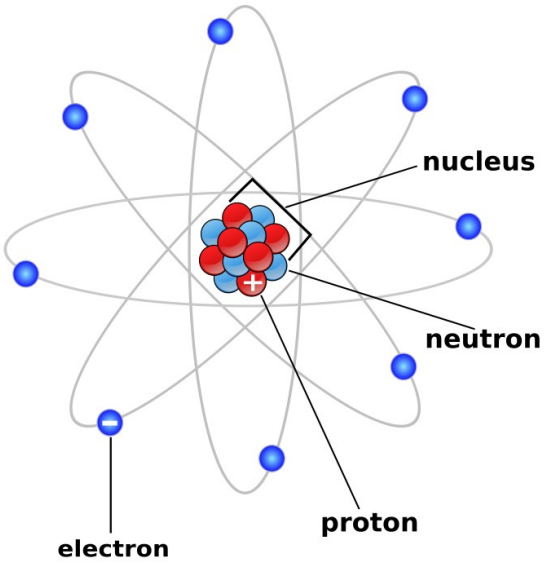
5. Atoms & Atomic Structure Brainpop "Atoms"

- an atom is the smallest piece of an element
- Atomic Structure
  : atoms are composed of three types of sub-atomic particles: **protons**, **neutrons** & **electrons**



Nucleus = central portion of atom
- small and dense (little empty space)
- gives an atom its weight **(atomic mass)**
- composed of:
  a) **protons**: positively **(+)** charged particles
  b) **neutrons**: neutral particles **(o)** with no charge

Electron Cloud = surrounds the nucleus
- composed of **electrons**
  : negatively **(-)** charged particles which orbit the nucleus in shells or **energy levels**
  : are very small and do not add much to the mass of an atom.

- An atom has the same number of protons as electrons **[PROTONS = ELECTRONS]** because of this, an atom has no charge
  = number of + charges is equal to – charges
- what makes 1 atom different from another is the number of subatomic particles it contains
  : the type of atom is determined by the number of **protons** in its nucleus
- as each element is composed of only one type of atom, it is the number of protons that **determine the element** and is used to organize them in the periodic table
- the atomic number is the number of protons. **[PROTONS = ATOMIC NUMBER]**
- Three things are equal in an atom: the number of protons, the number of electrons, and the atomic number.
  PROTONS = ELECTRONS = NUMBER (ATOMIC)

REMEMBER a **PEN** for Science class!

- What about the number of neutrons?
  - the number of neutrons in an atom can be calculated:
    [ATOMIC MASS – ATOMIC NUMBER = NUMBER OF NEUTRONS]
  - Example:

neutrons = Atomic Mass – Atomic Number
= 11 – 5
= 6

- Let's practice… What is the number of neutrons for each of the following elements?
  a) Chlorine _____
  b) Silicon _____
  c) Copper _____