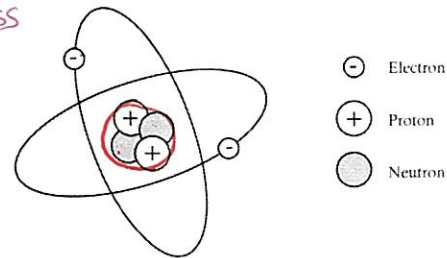


# SCIENCE 9: REVIEW OF SUBATOMIC PARTICLES AND BOHR MODELS

Atom: smallest unit of element with elemental properties; is neutral (no charge)

- **Proton:** positively charged particle in the nucleus of an atom; has a mass of 1 amu
- **Neutron:** uncharged particle in the nucleus of an atom; has a mass of 1 amu atomic mass unit
- **Electron:** negatively charged particle in energy shells surrounding the nucleus of the atom; very small (mass of 0 amu).



	Number of Protons (p)	Number of Neutrons (n)	Number of Electrons (e)
Atom	<u>equals atomic number</u>	<u>rounded atomic mass minus atomic number</u>	<u>equals atomic number</u>

Practice:

1) Why do atoms have the same number of protons and electrons?  
Atoms are neutral: number of positive and negative charges must be equal.

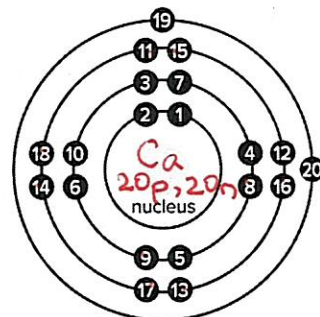
2) Explain why you need to subtract atomic number from atomic mass to calculate the number of neutrons in an atom.  
Protons and neutrons are the only particles with mass in an atom. Atomic number is the number of protons... the remaining mass is from the neutrons.

3) Complete the following table.

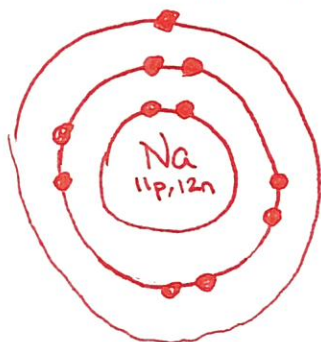
	protons	neutrons	electrons
Al	13	14	13
Mg	12	12	12
B	5	6	5
Ti	22	26	22
Ca	20	20	20
F	9	10	9
Cl	17	19	17
Ar	18	22	18
Zn	30	35	30

## Bohr Models of Atoms

- Calculate the number of protons, neutrons, electrons.
- In the nucleus:
  - Element symbol
  - Number of protons, neutrons
- Draw the electrons in energy shells:
  - Max electrons per shell from inside to outside:  
2, 8, 8, (18)
  - (Except in first shell), electrons are filled **starting at top**, going **clockwise**, singly at first then paired



Example: sodium atom 11p, 12n, 11e



Example: oxygen atom

