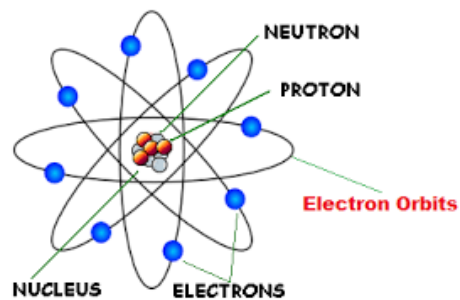


Atom: Smallest part of an **element** that has **all the properties of an element.**

Atomic Theory: An atom has a small **positively** charged nucleus surrounded by a large region in which there are enough **negatively** charged electrons to make the atom **neutral.**



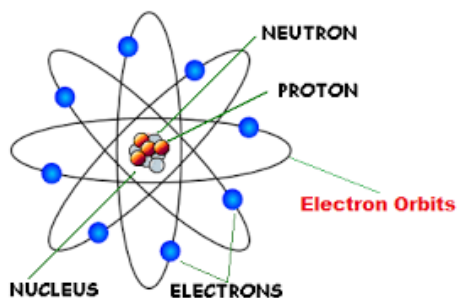
Nucleus: Small, dense **positively** charged center of an atom.

Proton: Positively charged subatomic particle located in the nucleus of an atom.

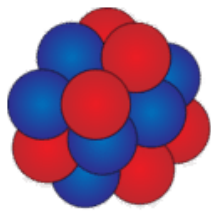
Neutron: Subatomic particle with no charge (**neutral**) located in the nucleus of an atom.

Electrons: **Negatively** charged subatomic particle found in an area **outside** the nucleus of an atom.

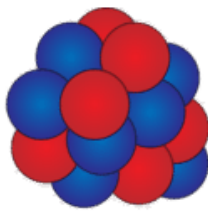
Electron Orbit: Space in which electrons are likely to be found, up to **2** in the first orbit, up to **8** in the second orbit, up to **8 or 18** in the third orbit.



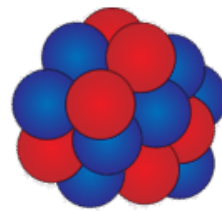
Isotopes: atom that has the same number of protons (atomic number) as another atom but a different number of neutrons



Carbon-12
98.9%
6 protons
6 neutrons



Carbon-13
1.1%
6 protons
7 neutrons



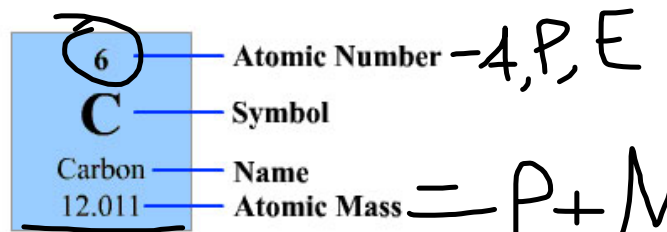
Carbon-14
<0.1%
6 protons
8 neutrons

Particle	Mass (amu)	Charge	Location
Proton	1.0073	+	Nucleus
Neutron	1.0087	Neutral	Nucleus
Electron	0.0006	-	Electron Cloud

Atomic Number: Number of **protons** in the nucleus of an atom (also how many **electrons**) **APE = Atomic # = # Protons = # Electrons**

Atomic Mass: Weighted average of the atomic masses of an element's naturally occurring isotopes.

Mass Number: Sum of the **protons** and **neutrons** in the nucleus of an atom.



Atomic Number = Protons = Electrons

Atomic Mass (rounded) - Atomic Number = Number of Neutrons

Element	Symbol	Atomic Number	Atomic Mass	# of protons	# of neutron	# of electron
Oxygen	O	8	16	8	8	8
Potassium	K	19	39	19	20	19

Periodic Table of the Elements

1	Periodic Table of the Elements																18
1 H Hydrogen 1.008																	2 He Helium 4.003
3 Li Lithium 6.941	4 Be Beryllium 9.012											5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180
11 Na Sodium 22.990	12 Mg Magnesium 24.305											13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.066	17 Cl Chlorine 35.453	18 Ar Argon 39.948
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 84.798
37 Rb Rubidium 84.468	38 Sr Strontium 87.62	39 Y Yttrium 88.906	40 Zr Zirconium 91.224	41 Nb Niobium 92.906	42 Mo Molybdenum 95.95	43 Tc Technetium 98.907	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.906	46 Pd Palladium 106.42	47 Ag Silver 107.868	48 Cd Cadmium 112.414	49 In Indium 114.818	50 Sn Tin 118.711	51 Sb Antimony 121.760	52 Te Tellurium 127.6	53 I Iodine 126.904	54 Xe Xenon 131.294
55 Cs Cesium 132.905	56 Ba Barium 137.328	57-71 Lanthanides	72 Hf Hafnium 178.49	73 Ta Tantalum 180.948	74 W Tungsten 183.84	75 Re Rhenium 186.207	76 Os Osmium 190.23	77 Ir Iridium 192.217	78 Pt Platinum 195.085	79 Au Gold 196.967	80 Hg Mercury 200.592	81 Tl Thallium 204.383	82 Pb Lead 207.2	83 Bi Bismuth 208.980	84 Po Polonium [209]	85 At Astatine 209	86 Rn Radon 222.018
87 Fr Francium 223.020	88 Ra Radium 226.025	89-103 Actinides	104 Rf Rutherfordium [261]	105 Db Dubnium [262]	106 Sg Seaborgium [266]	107 Bh Bohrium [264]	108 Hs Hassium [269]	109 Mt Meitnerium [268]	110 Ds Darmstadtium [269]	111 Rg Roentgenium [272]	112 Cn Copernicium [277]	113 Uut Ununtrium unknown	114 Fl Flerovium [289]	115 Uup Ununpentium unknown	116 Lv Livermorium [293]	117 Uus Ununseptium unknown	118 Uuo Ununoctium unknown
57 La Lanthanum 138.905	58 Ce Cerium 140.116	59 Pr Praseodymium 140.908	60 Nd Neodymium 144.243	61 Pm Promethium 144.913	62 Sm Samarium 150.36	63 Eu Europium 151.964	64 Gd Gadolinium 157.25	65 Tb Terbium 158.925	66 Dy Dysprosium 162.500	67 Ho Holmium 164.930	68 Er Erbium 167.259	69 Tm Thulium 168.934	70 Yb Ytterbium 173.055	71 Lu Lutetium 174.967			
89 Ac Actinium 227.028	90 Th Thorium 232.038	91 Pa Protactinium 231.036	92 U Uranium 238.029	93 Np Neptunium 237.048	94 Pu Plutonium 244.064	95 Am Americium 243.061	96 Cm Curium 247.070	97 Bk Berkelium 247.070	98 Cf Californium 251.080	99 Es Einsteinium [254]	100 Fm Fermium 257.095	101 Md Mendelevium 288.1	102 No Nobelium 289.101	103 Lr Lawrencium [262]			

Alkali Metal	Alkaline Earth	Transition Metal	Basic Metal	Semimetal	Nonmetal	Halogen	Noble Gas	Lanthanide	Actinide
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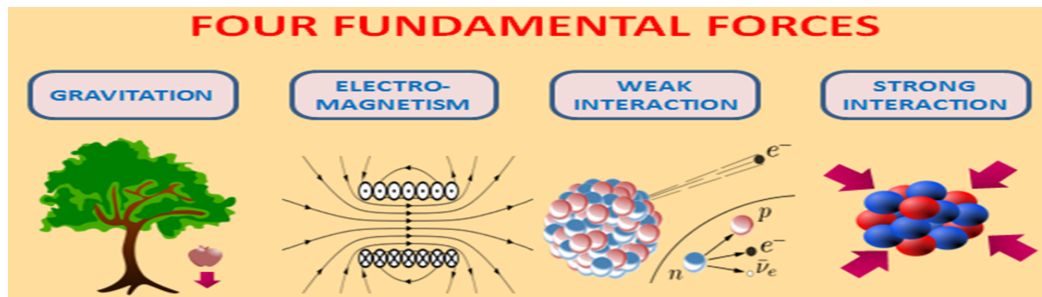
Forces that Within the Atom

Electromagnetic Force- Force of attraction or repulsion between particles in an atom.

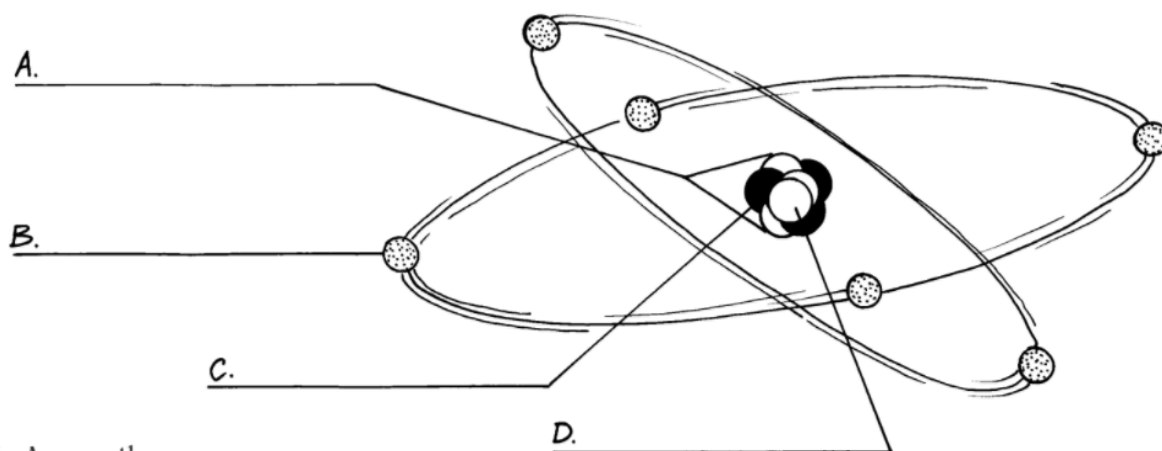
Strong Force- Force that binds protons and neutrons in the nucleus Strongest Force.

Weak Force- Force that is the key to the power of the sun, radioactive decay.

Gravity- The weakest force of attraction that depends on the mass of two objects and the distance between them.



I. Label the parts of this atom (nucleus, protons, electrons, neutrons).



II. Answer these:

- _____ 1. the part of the atom that carries no electric charge
- _____ 2. the part of the atom that carries a positive charge
- _____ 3. the part of the atom that carries a negative charge
- _____ 4. the number of electrons that can be held in the first orbit
(closest to the nucleus)
- _____ 5. the number of electrons that can be held in the second orbit
- _____ 6. the number of electrons that can be held in the third orbit
- _____ 7. there are the same number of these two particles in an atom
- _____ 8. the atomic number is the same as the number of these particles

Draw your own model of an atom with eight protons, eight neutrons, and eight electrons (an oxygen atom).