

ATOMIC STRUCTURE Review NAME: _____ Date: _____ Block: _____

Use your periodic table to answer the following questions and fill out the following tables.

Subatomic Particle	Charge	Mass	Location	Formula
Proton (defines the type of atom)	+1	1	Nucleus	= atomic number
Neutron	0	1	Nucleus	= mass number - atomic number
Electron	-1	0	Electron clouds orbiting the nucleus	= atomic number - charge

$p^+ = e^-$ in a neutral atom

If there is a negative charge the ion has more electrons than protons (gained e^- to become an anion)

If there is a positive charge the ion has less electrons than protons (lost e^- to become a cation)

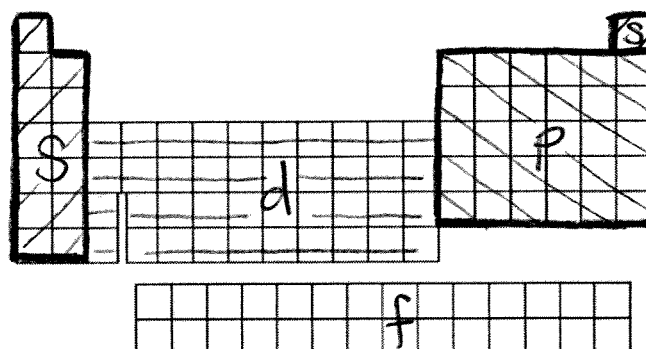
Atomic mass	28.0855
Symbol	Si
Atomic number	14
Name	Silicon

- Atomic number 14
- # of protons 14
- # of electrons 14
- # of neutrons in Silicon-30 $30 - 14 = 16$
- Molar mass 28.09
- # valence electrons 4

	Protons	Neutrons	Electrons	Mass Number	Atomic/ Nuclear Symbol
a. tin-120	50	70	50	120	$^{120}_{50}\text{Sn}$
b. boron-11	5	6	5	11	$^{11}_5\text{B}$
c. gallium-69	31	38	31	69	$^{69}_{31}\text{Ga}$
d. sulfur-35	16	19	16	35	$^{35}_{16}\text{S}$

	Protons	Electrons
a. Cl^{1-}	17	18
b. Al^{3+}	13	10
c. S^{2-}	16	18
d. Li^{1+}	3	2
e. O^{2-}	8	10

Label periodic table with s, p, d, and f-block

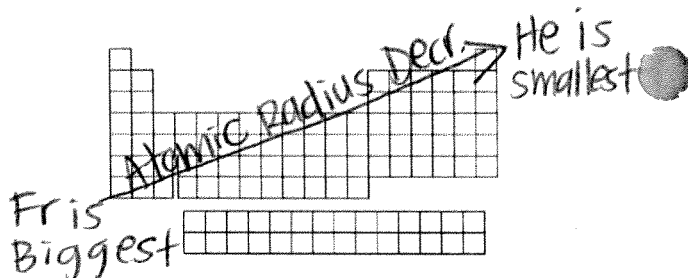


Define isotope:

Define and describe the periodic trend exhibited by each of the following. Label these trends on periodic table.

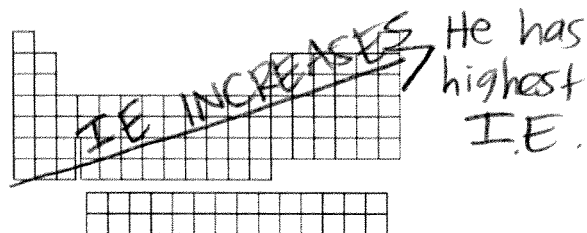
Atomic radius: atom size

- * More E levels = Bigger atom
- * If same # E levels, then the atom with more protons is smaller due to stronger attraction between nucleus and valence e⁻.



Ionization energy: E needed to remove an e⁻ from atom.

- * Stronger attraction e⁻ has to nucleus, the harder it is to remove the e⁻, thus higher ionization E



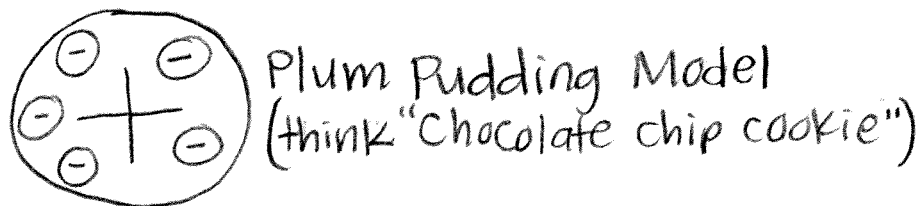
Electronegativity: Ability to attract e⁻ in a bond.

- * Exclude Noble gases (since they do not bond)
- * Smaller atom = higher electronegativity

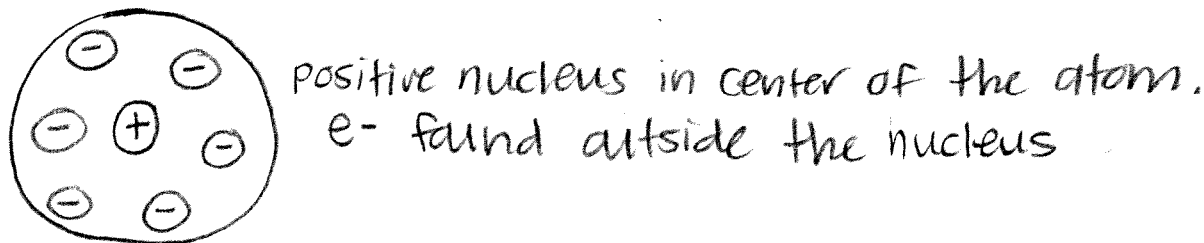


Describe and Draw each of the following atomic models.

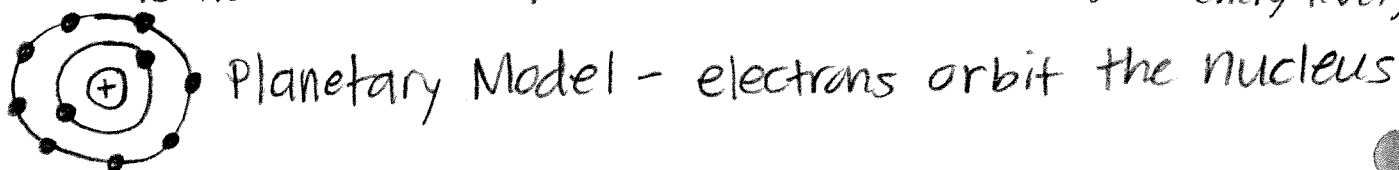
Thomson: discovered the electron; cathode ray tube experiment



Rutherford: discovered the nucleus; Gold Foil Experiment



Bohr: electrons have a specific amount of E (e⁻ are in a given energy level)



- * Quantum-Mechanical: electrons are in orbitals (s, p, d, f) - 3D space in which e⁻ move randomly. Each orbital can hold up to 2 e⁻. * We currently use this model

