The Periodic Table

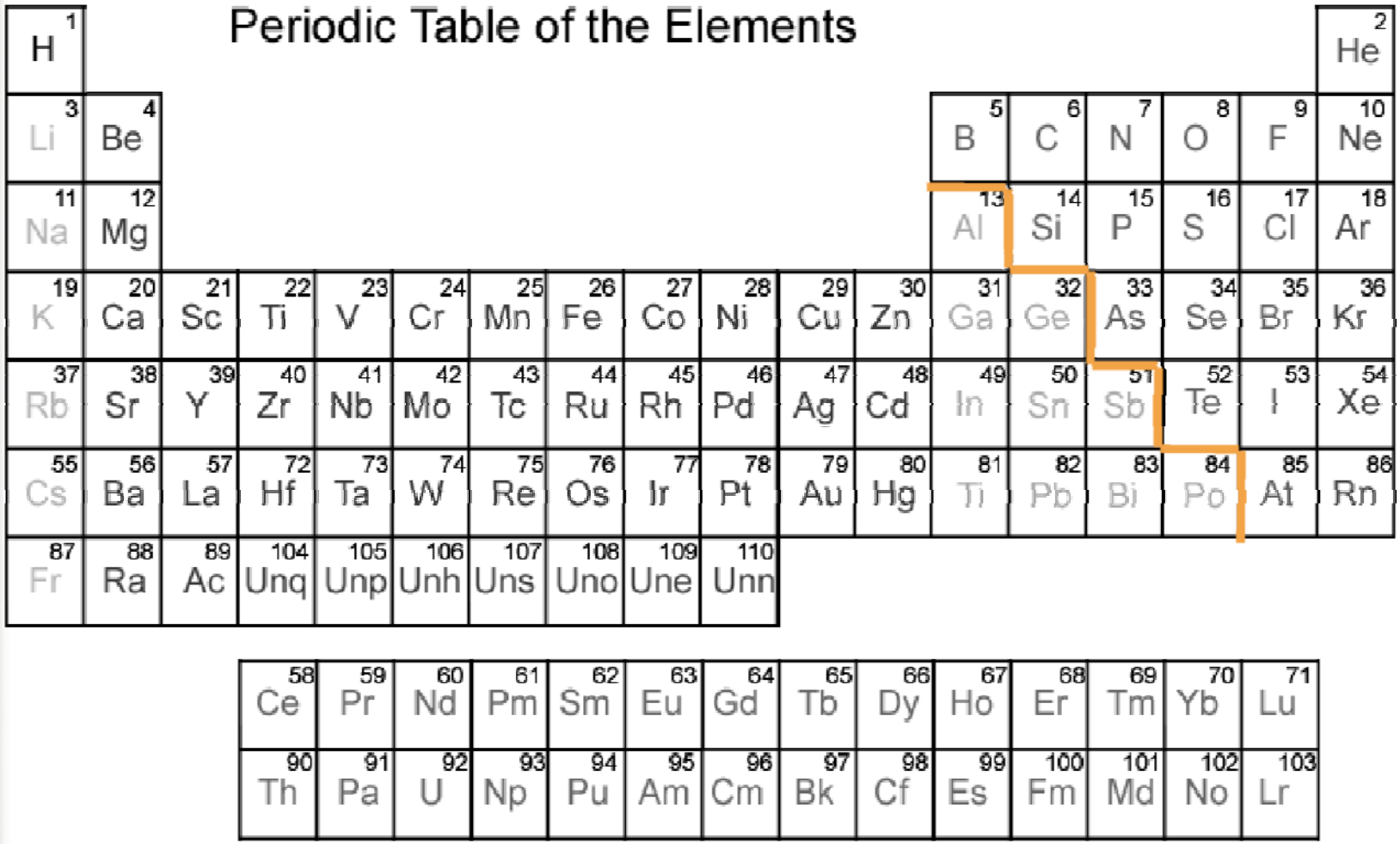
Mr. Spraggins

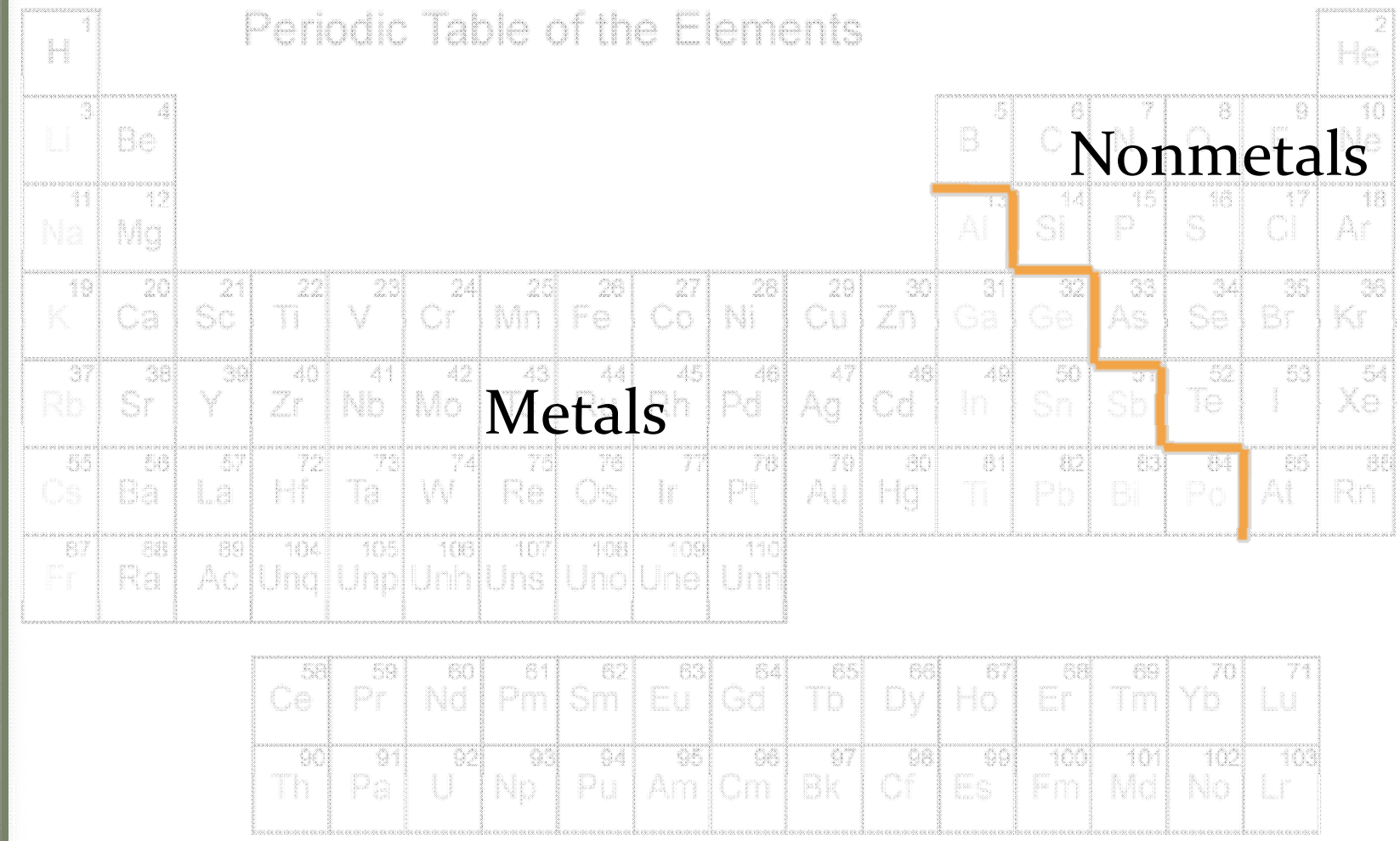
Periodic Table of the Elements

1 H																	2 He
3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
55 Cs	56 Ba	57 La	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Ti	82 Pb	83 Bi	84 Po	85 At	86 Rn
87 Fr	88 Ra	89 Ac	104 Unq	105 Unp	106 Unh	107 Uns	108 Uno	109 Une	110 Unn								

58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

Periodic Table of the Elements




Periodic Table of the Elements
Nonmetals
Metals

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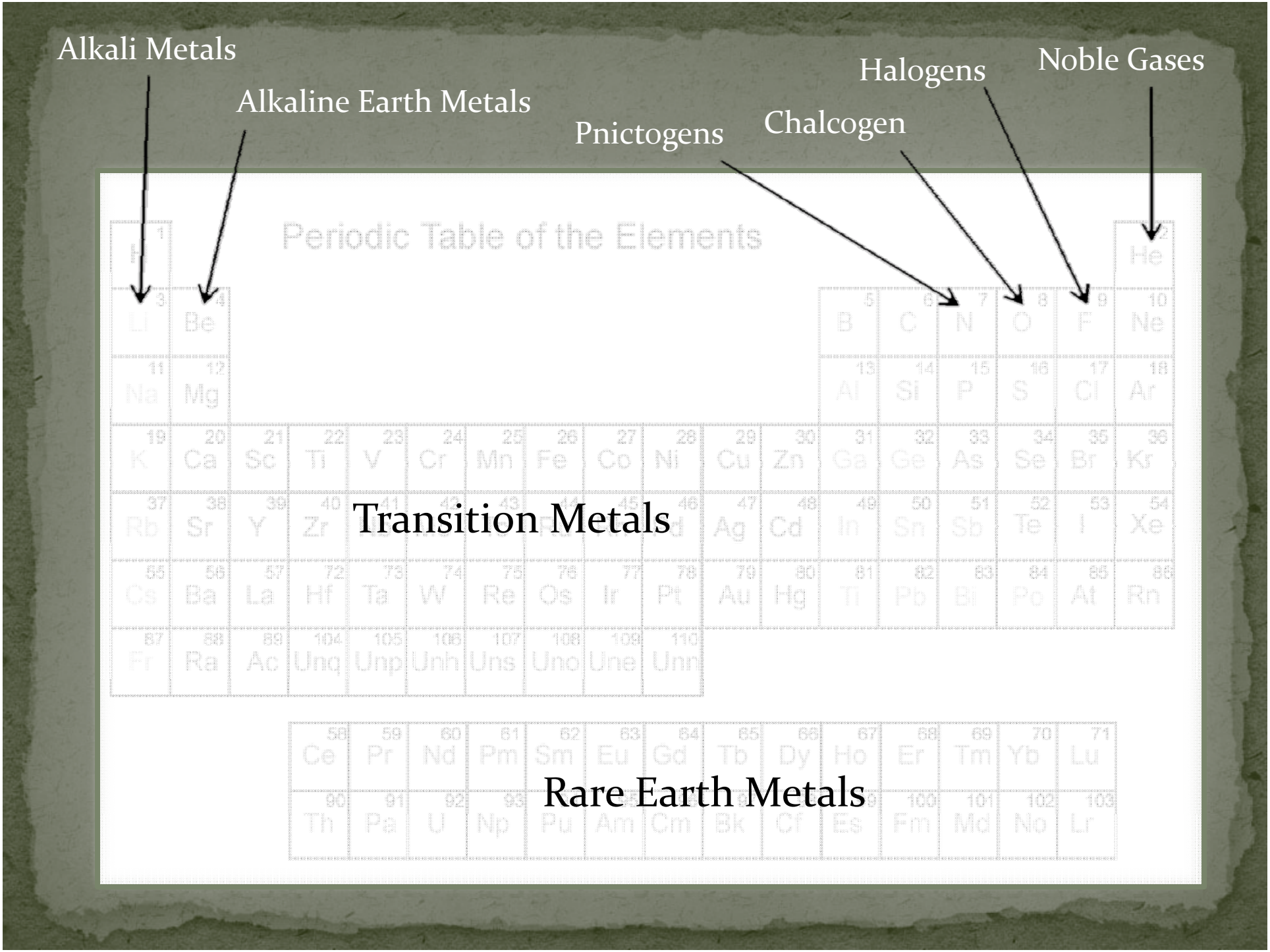

Alkali Metals
Alkaline Earth Metals
Pnictogens
Chalcogen
Halogens
Noble Gases
Periodic Table of the Elements
Transition Metals
Rare Earth Metals

Group I

Alkali Metals

- Lithium (Li), Sodium (Na), Potassium (K), Rubidium (Rb), Caesium (Cs), and Francium (Fr).

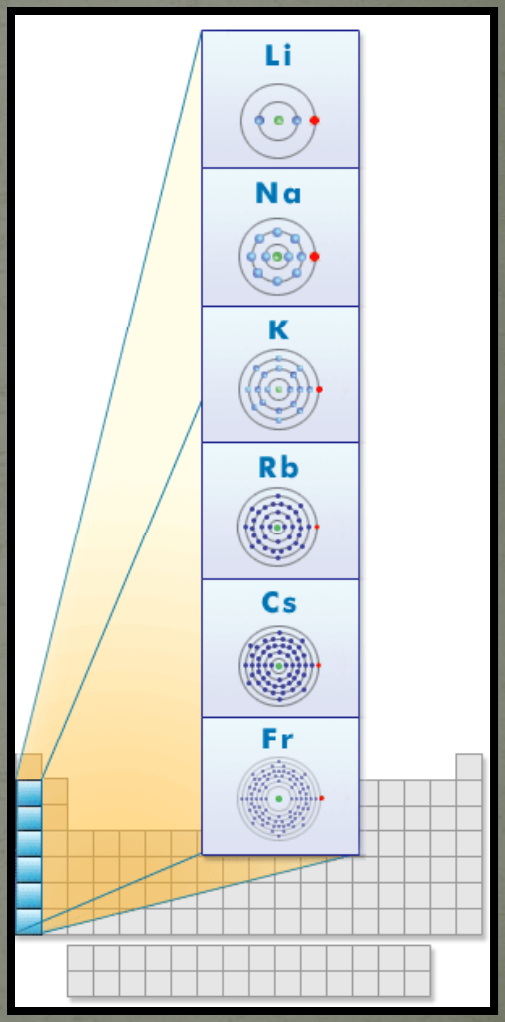
- EXTREMELY REACTIVE!!!

- Silver in color

- Soft

- *NaCl* – Table Salt
- *Li* used in batteries
- *K* used in Fireworks
- *Rb* & *Cs* used in Photocells
- *Fr* has no uses (radioactively unstable).

- ALKALI?
    - Arabic for base



Group II

Alkali Earth Metals

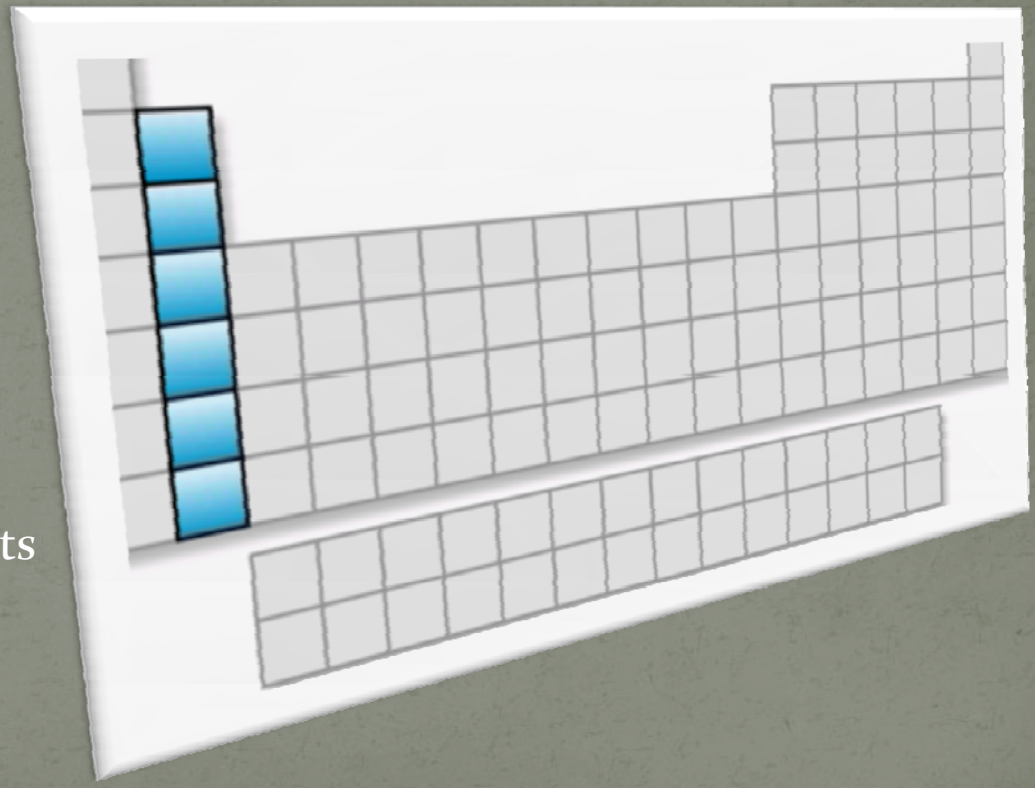
- Beryllium (Be), Magnesium (Mg), Calcium (Ca), Strontium (Sr), Barium (Ba), and Radium (Ra).

- Very Reactive

- Silver in color

- Soft

- *Be* Alloys-spacecraft
- *Mg* used in flares
- *CaCO3* – lime stone
- *Sr* used in red fireworks
- *Ba* -pigment and rat poison
- *Ra* – Glow-in-the-dark paints



- ALKALI?
    - Arabic for base

$CaCO_3$

Lechuguilla Cave

New Mexico, USA

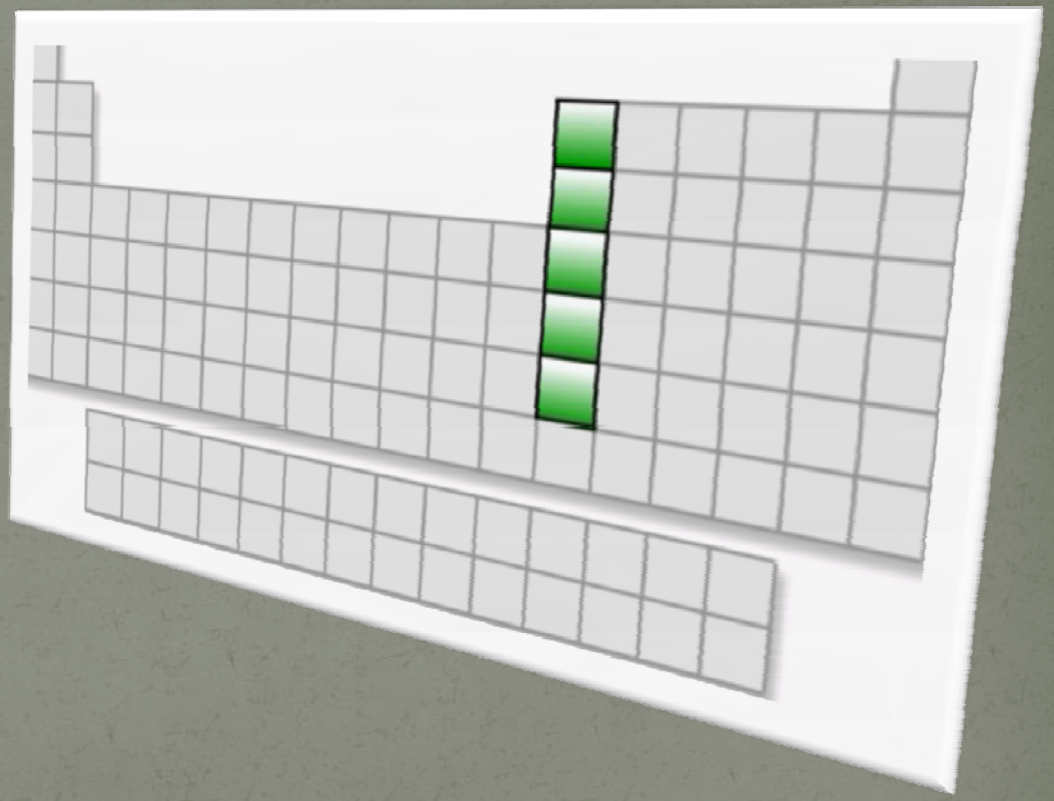
Group III

Boron Family

- Boron (B), Aluminum (Al), Gallium (Ga), Indium (In), and Thallium (Tl).

- B is a metalloids
- Al, Ga, In and Tl are metals

- *B* – flares and rockets
- *Al* used to make everything from cans to airplanes.
- *Ga* & *In* used to make mirrors
- *Th* used in Photocells



Group IV

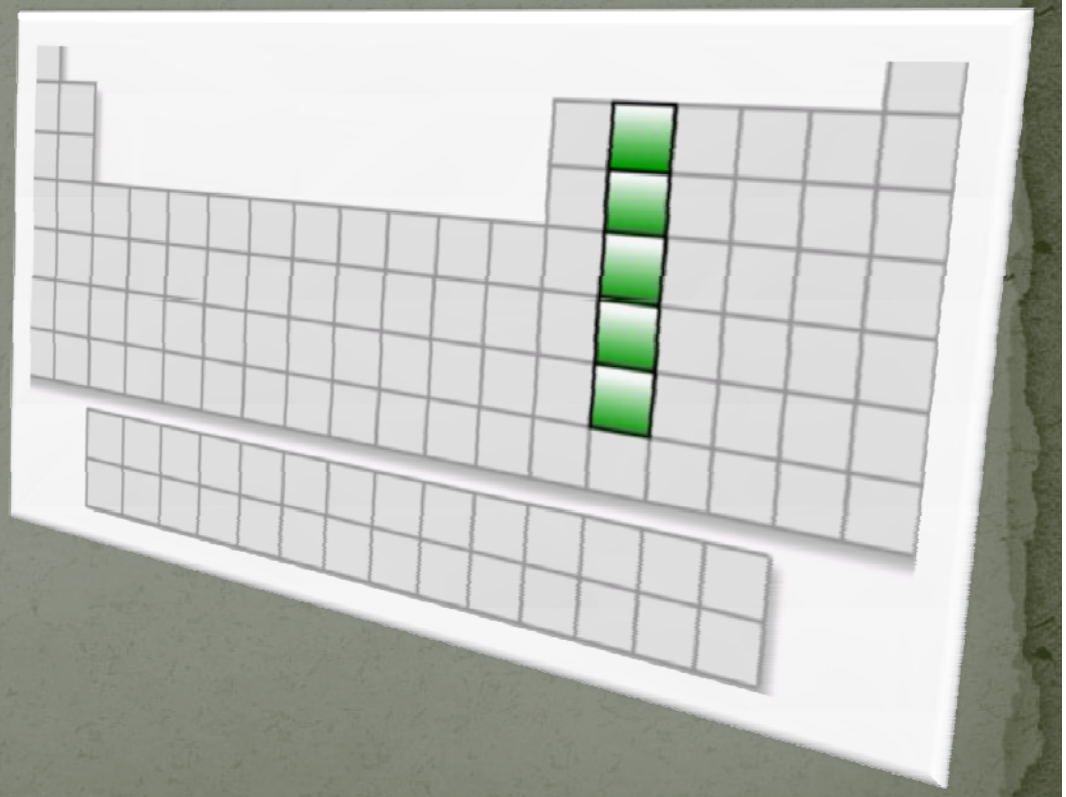
Carbon Family

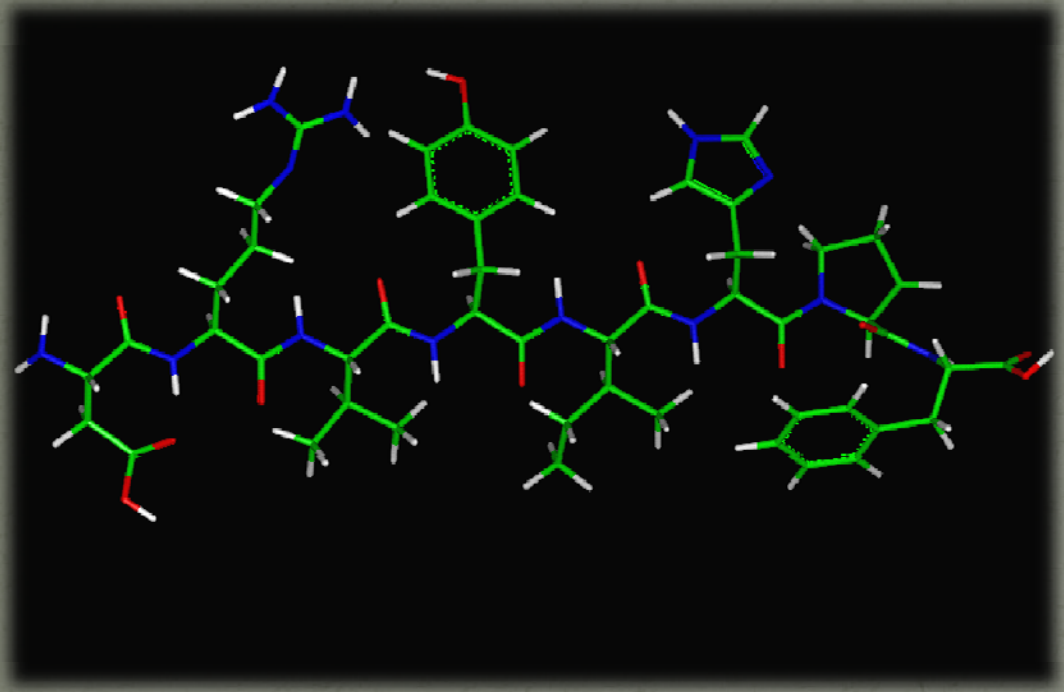
- Carbon (C), Silicon (Si), Germanium (Ge), Tin (Sn), and Lead (Pb).

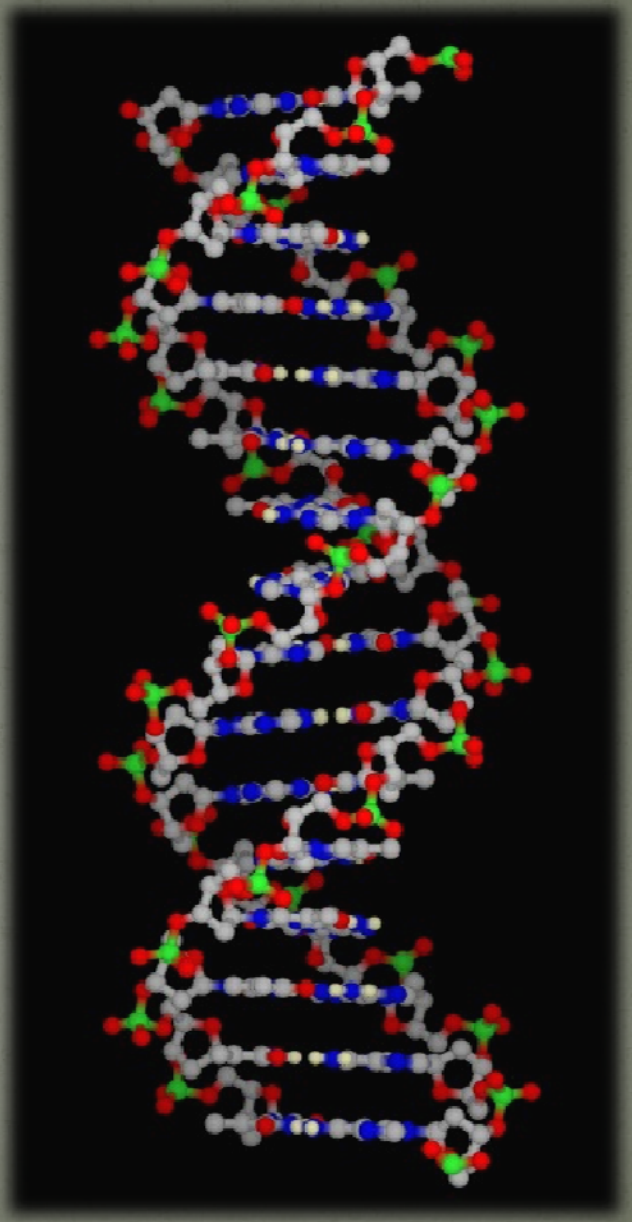
- THE STRANGE GOUP!

- *C* and *Si* are nonmetals
- *Si* and *Ge* are metalloids
- *Sn* and *Pb* are metals

- Very important
  - Carbon: Life
  - *Si* & *Ge* used in Computers
  - *Pb* - Blocks Radiation







Group V

Pnictogens

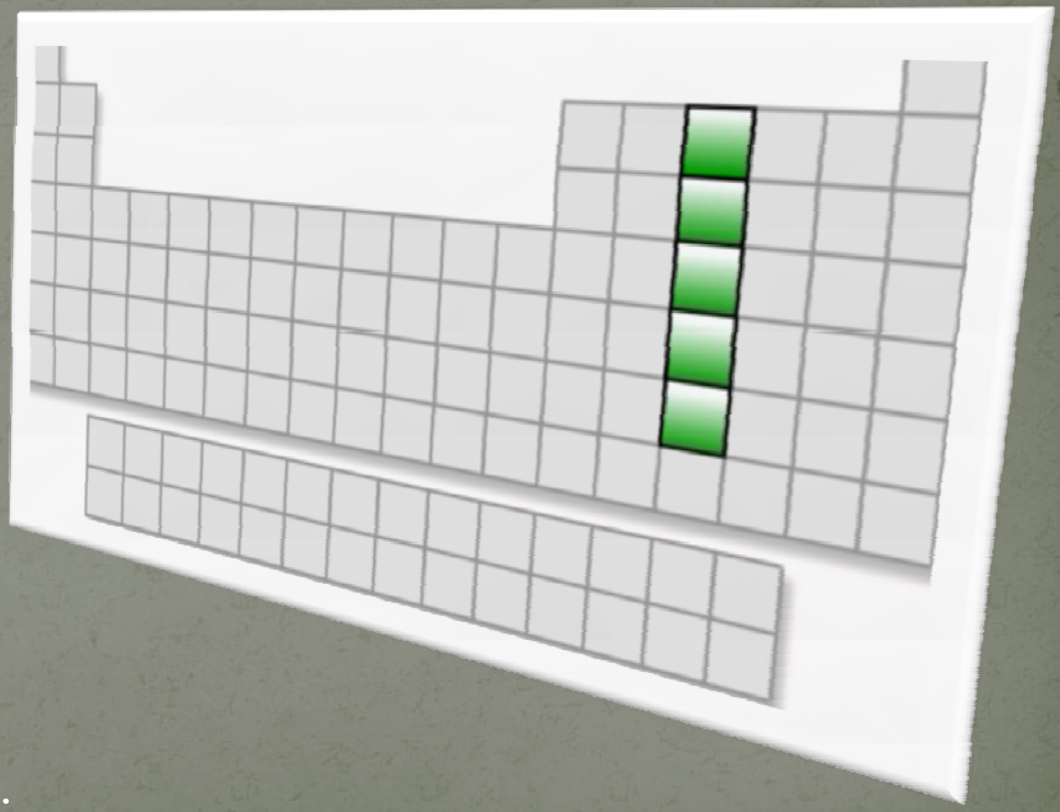
Aka: Nitrogen family

- Nitrogen (N), Phosphorus (P), Arsenic (As), Antimony (Sb), and Bismuth (Bi).

- N and P are nonmetals
- As, Sb and Bi are metalloids

- Form very stable compounds

- *NH_3* very important reactant
- *P* used as a fertilizer
- *As* used in lasers
- *Sb* used to make flameproof materials.
- *Bi* used in cosmetics



- Pnictogens?
  - From the Greek word pnigein meaning to choke.

Group VI

Chalcogen

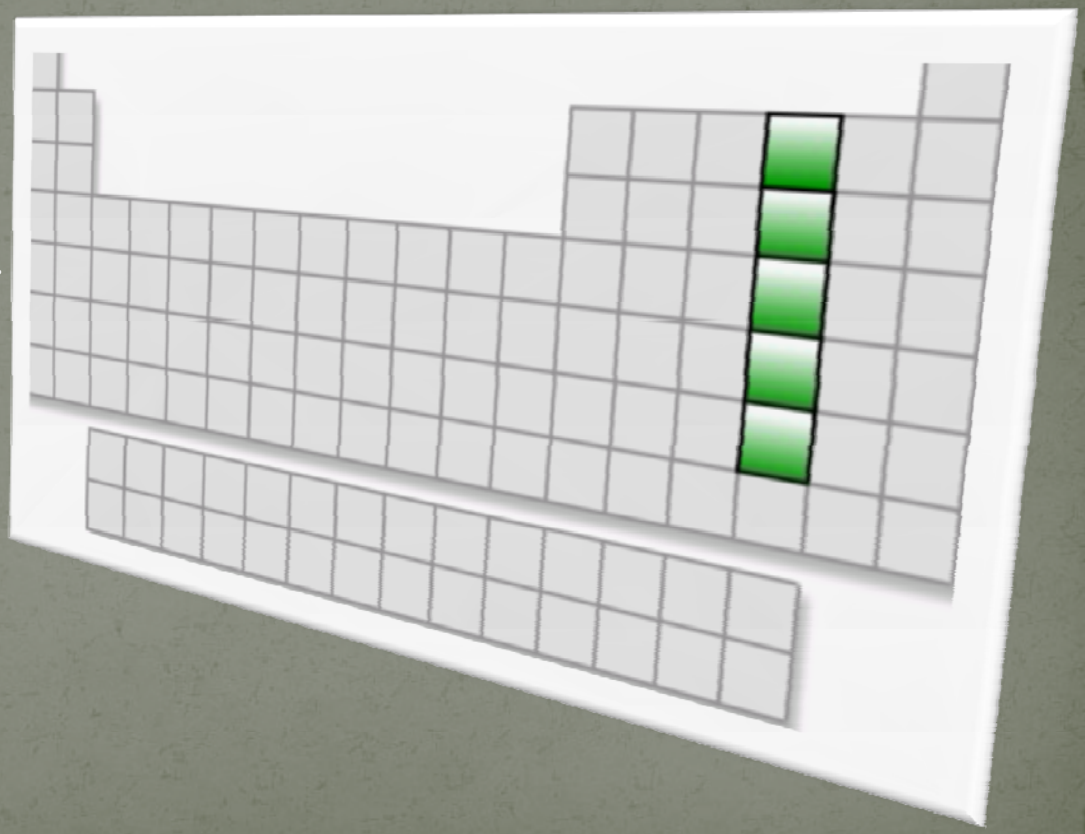
Aka: Oxygen family

- Oxygen (O), Sulfur (S), Selenium (Se), Tellurium (Te), Polonium (Po).

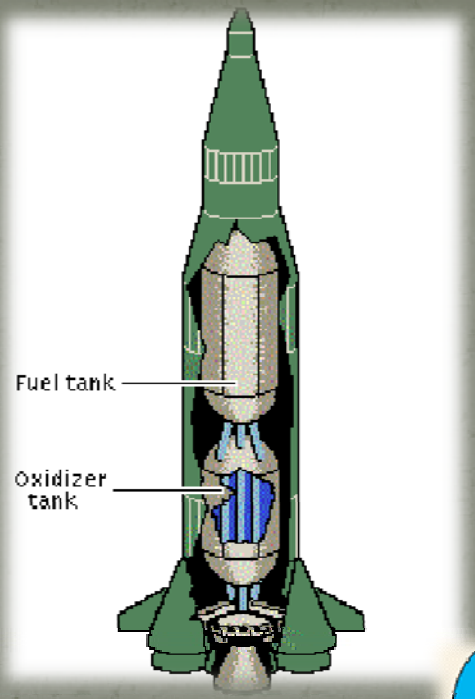
- Reactive

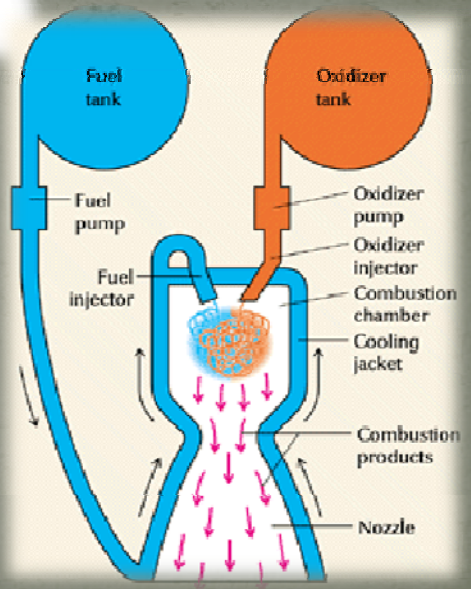
- O and S are nonmetals
- Se, Te, and Po are metals

- Found in minerals
  - Pyrite (FeS_2)
- *O* – breathing and rocket fuel.
- *H_2SO_4* – most produced chemical in the world.
- *Se* used in photocopiers
- *Te* used to tint glass
- *Po* used to power space satellites.



- Chalcogen?
  - Greek for “ore former”


Fuel tank
Oxidizer tank


Fuel tank
Oxidizer tank
Fuel pump
Oxidizer pump
Oxidizer injector
Fuel injector
Combustion chamber
Cooling jacket
Combustion products
Nozzle

Group VII

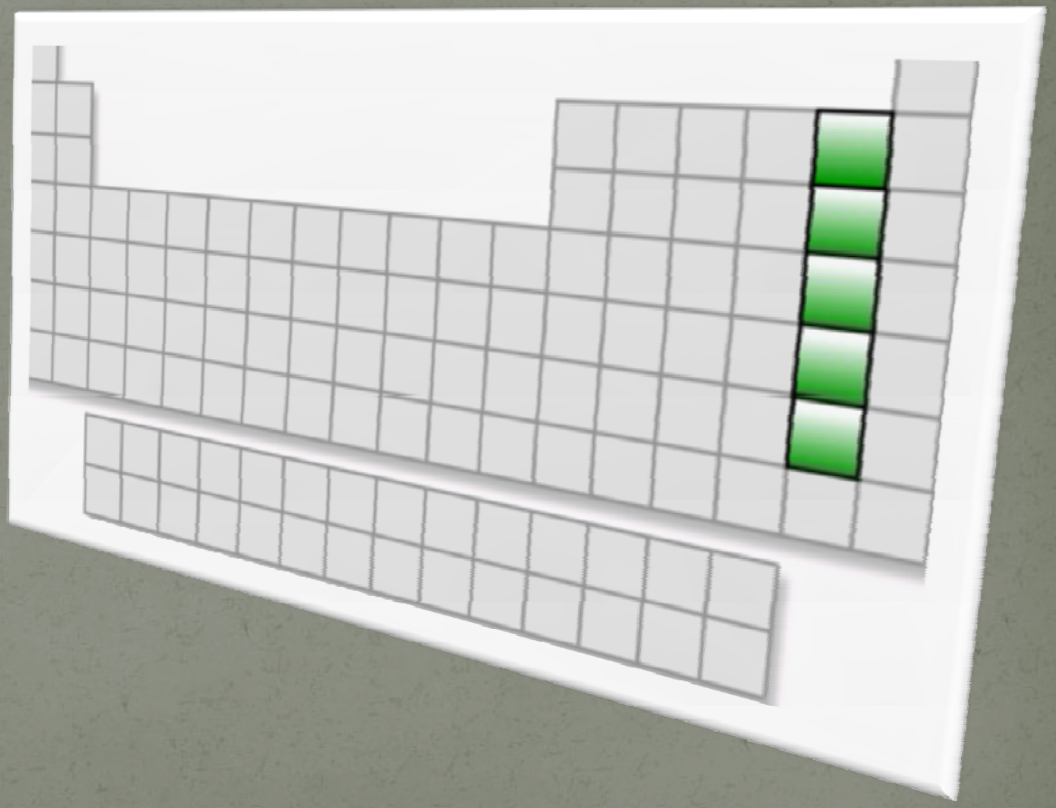
Halogens

- Fluorine (F), Chlorine (Cl), Bromine (Br), Iodine (I), and Astatine (At).

- Very Reactive

- F_2 & Cl_2 are gases
- Br_2 is a liquid
- I_2 and At_2 are solids

- *F* – used in air conditioners.
- *Cl* makes drinking water safe.
- *Br* used in medicine and dyes
- *KI* used as disinfectant
- *At* – none
    - Radioactively unstable.



- Halogens?
    - Means “salt-former.”

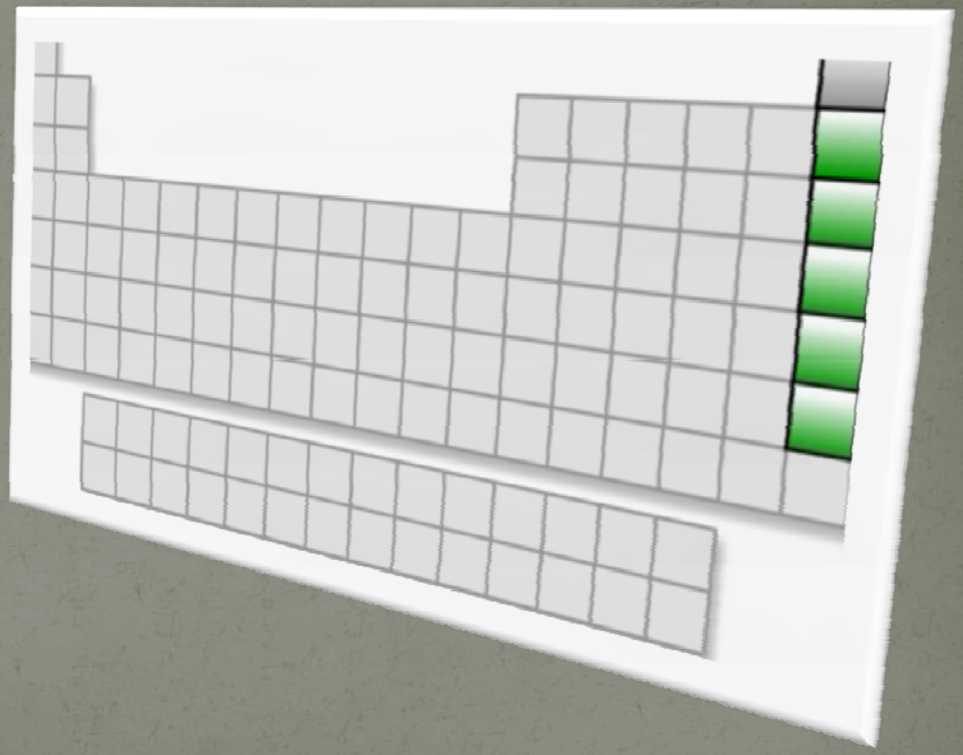
Group VIII

Noble Gases

- Helium (He), Neon, (Ne), Argon (Ar), Krypton (Kr), Xenon (Xe), and Radon (Rn).

- Odorless
- Colorless
- Uncreative

- *He* used for balloons and cryogens
- *Ne* – signs and lasers
- *Ar* – inert atmosphere
- *Kr* used in photography
- *Rn* used to detect earthquakes

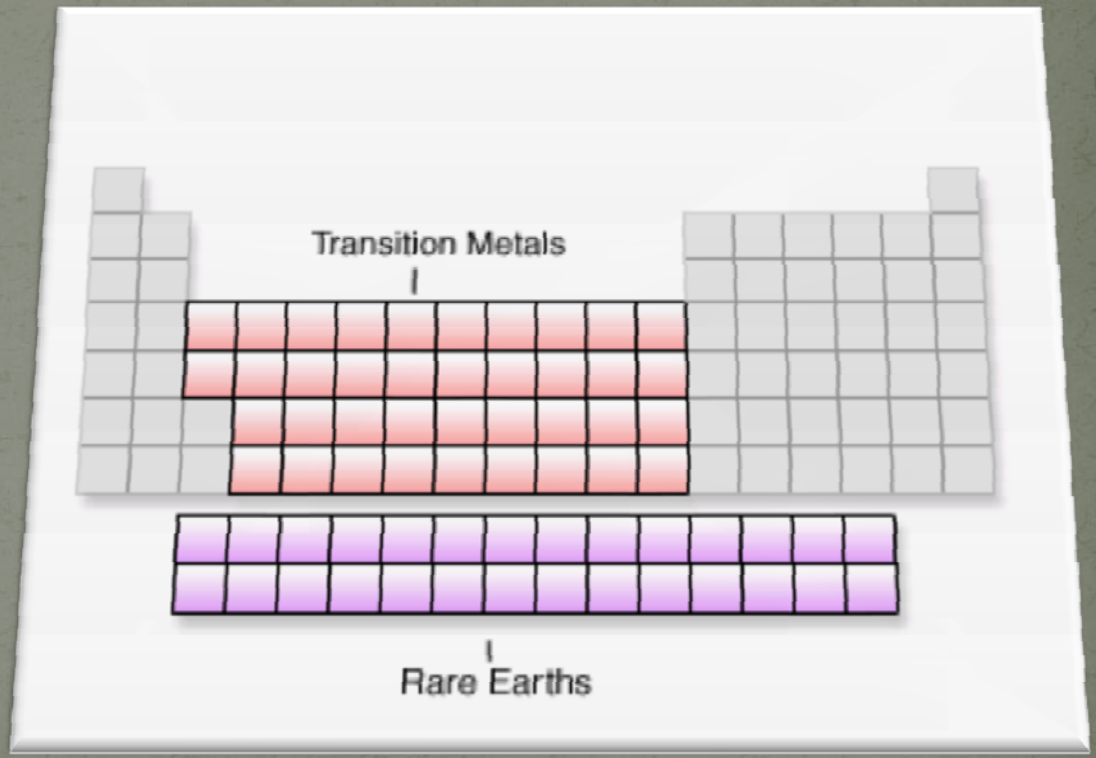


- Noble Gas?
  - Comes from the German *Edelgas* meaning low reactivity. (Hugo Erdmann, 1898)

Transition and Rare Earth Metals

- Transition Metals
  - Very Colorful
  - Different Oxidation Numbers
  - Can Be used as catalysts

- Rare Earth Metals
  - Superconductors
    - Make really strong Magnets!



Periodic Table of the Elements